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BIDS FOR THREE BATTLESHIPS.

Brief reference was made in the last issue of the Review to bids opened by the navy department on the day of going to press for the construction of the Minnesota, Vermont and Kansas, the three 16,000-ton battleships authorized by the recent congress, each to cost not exceeding $4,212,000. Following were the bids: Newport News Ship Building & Dry Dock Co., Newport News, Va., one vessel at $4,110,000; William Cramp & Sons Ship & Engine Building Co., Philadelphia, Pa., one vessel for $4,190,000, or two vessels at $4,181,000 each; Fore River Ship & Engine Co., Quincy, Mass., one vessel at $4,179,000; Eastern Ship Building Co., New London, Conn., one vessel at $4,192,000; New York Ship Building Co., Camden, N. J., one vessel at $4,165,000. Contrary to expectations Secretary Moody has not yet awarded contracts for any of these vessels. The bids approximate the sum set aside so closely that there is scarcely any margin left for equipment. Equipment must also come out of the $4,212,000 appropriated. Rear Admiral Bowles has made a special report to the secretary upon this subject and the secretary is now considering it.

These battleships will be the most powerful vessels of the American navy. They will have a required speed of 18 knots, a displacement of 16,000 tons, a main battery of four 12-in. eight 8-in. and twelve 7-in. breechloading rifles, and a secondary battery of twenty 3-in., 14-pounder, rapid-fire guns; twelve 3-pounder semi-automatic guns, six 1-pounder automatic guns, two 1-pounder semi-automatic guns, two 3-in. field pieces, two machine guns and six automatic guns. The 12-in. guns will be mounted in pairs, in two electrically-controlled balanced, elliptical turrets, on the center line, one forward and one aft, each with an arc of fire of about 270 degrees; the 8-in. guns in four electrically-controlled balanced elliptical turrets, two on each beam, at each end of the superstructure; the 7-in. guns in broadside, on pedestal mounts on the gun deck behind 7-in. armor, each isolated by splinter bulkheads of nickel steel forward and after guns arranged to fire right ahead and right astern, respectively; the other 7-in. guns to have the usual broadside trains. Guns of the secondary battery will be mounted in commanding positions having a large arc of unobstructed fire. They will have 12-in. and 8-in. turrets. A complete belt of armor 9 ft. 3 in. wide will protect the hull at the waterline, and the necessary casemate armor and protection for ammunition tubes will be provided. The protected deck will extend from stem to stern, built up of 20-lb. plating with nickel steel of 40 lbs. on the flat and 100 lbs. on the slope.

Vertical twin-screw, four-cylinder triple-expansion engines will propel them, and each vessel will have twelve water-tube boilers. The total ammunition of each vessel will be 594.8 tons. Following are the general dimensions and other features: Length on load water line, 450 ft.; extreme breadth at load water line, 76 ft. 10 in.; trial displacement, 16,000 tons; mean draught, 24 ft. 6 in.; gross draught, full load, about 27 ft. 9 in. total coal capacity, 2,200 tons.

IN JUSTICE TO MR UHLER.

When Mr. George Uhler was appointed supervising inspector-general of the steamboat inspection service a caustic critic here and there said that as water will rise no higher than its source Mr. Uhler would not be able to circumvent his training and that he would by instinct favor marine engineers. Those who know Mr. Uhler know, of course, that he is broad enough to see both sides of an issue; but yet the treasury department has seen fit to call attention to the very circumstance mentioned in the opening sentence. As known, there is trouble along the coast with marine engineers. The other day the following anonymous letter, received by a steamship line, was forwarded to the treasury department:

"We engineers of New York won out our strike because Mr. Uhler, whom we put in Washington, backs us up. You might just as well give in and pay us the wages as long as he is in Washington."

The treasury department accordingly issued the following statement:

"The statement in this letter is an absolute falsehood. An engineer who violates the law, no matter what his affiliations may be, will have his license revoked as soon as his case is presented to the inspectors. A steamboat owner who violates the law will be fined. The supervising inspector general of steamboats will enforce the law as it stands. No association had anything to do with Mr. Uhler's appointment. In fact, he was unaware of his selection until the day the appointment was made. Before he took the oath of office the department telegraphed Mr. Uhler as follows:

"'Revised statutes prohibit anyone identified with any association of engineers, or similarly affiliated, holding place to which you have been appointed. Please resign at once from all connections of that character or anything that would in the least give appearance of conflict with section forty-four sixteen revised statutes.'

"In answer to the foregoing, signed by Assistant Secretary R. B. Armstrong, Mr. Uhler replied as follows:

"'Conditions of your telegram have already been complied with. Have no conflicting affiliations whatever.'

"The treasury department would take no notice whatever of any statements, anonymous or otherwise, except that these statements are doing the supervising inspector general of steamboats an injustice. Any engineer who assumes that he can violate the law without incurring the penalty provided is mistaken."

NEW FALL RIVER LINE SIDE-WHEELER.

The fleet of the Fall River Line, marine adjunct of the New York, New Haven & Hartford Railroad Co., will shortly be increased by two steamers which are now building at the works of the Fore River Ship & Engine Co., Quincy, Mass. One of them will be a side-wheel passenger steamer, typical of Long Island sound. The extent of Sound traffic is not easily grasped. In a single summer night 10,000 passengers pass up and down and the value of freight carried approximates $200,000,000 per annum. The development of the Sound type of steamboat has been steady and interesting.

Soon after Fulton's first steamboat made her successful trip on the Hudson, steamers were put upon the Sound between New York and New Haven. In 1827 the Chancellor Livingston was taken off the Hudson and put on the route between New York and Providence. She was one of the most celebrated of the early craft, having been built in 1816 of oak, cedar and locust by Henry Eckford, who, in his day, was a most successful ship builder. Her tonnage was 496, when most merchantmen did not go over 300 tons; her length was 157 ft., her width 33 ft. She was American built, even to her boilers and engines. She showed in hull and upper works some promise of the development that has come in latter day side-wheelers. She had a suggestion of the overhanging guards, the rounded paddleboxes and the tiers of decks that mark the boats of today, but she had three masts well hung with sails, and every advantage was taken of natural motive power. She once made the trip from Albany to New York in eighteen hours, and there was much bragging over the record.

Year by year the number of steam vessels—then all side-wheelers—increased, and after a time came the invention of a screw propeller, which began to replace the paddles on the larger craft. The propeller is best for long ocean voyages, where a ship is subject to the swing and thrust of great seas, but there is nothing like the side-wheeler with high speed and shallow draught. The New York is a second marker in the development of the side-wheeler. In her the tonnage crept to 524, while the guards swept from stem to stern in a graceful curve and decks began to rise from them. The Massachusetts, of 626 tons, built a little later showed the gradual development of the type, and began to look something like the modern craft. She had no mast, two funnels and a walking beam.

So the growth went on until the Bristol, of 1865, became the culmination of wooden vessel construction. The Bristol and her sister ship, the Providence, became world renowned as the most palatial vessels known. The Bristol was 373 ft. over all and had a beam of the hull of 48 ft., beyond which her guards extended, so that her total width of deck was 83 ft. Her tonnage was 2,962, and there were accommodations in her tiers of deck rooms for 1,200 passengers.

The first Sound steamer to have a steel hull is said to have been the City of Worcester, built in 1881. She was followed seven years later by the Puritan, the first of the present fleet of the Fall River Line. The Priscilla was an advance on the Puritan in size, strength and beauty of appearance. She is the greatest side-wheeler afloat, having a displacement of 5,292 tons, a speed of 22 knots and passenger quarters for 1,500 persons.

The steamer now building at the Fore River works is a little smaller than the Priscilla. She has finer lines than the other boat, and with equal power should show greater speed. Her dimensions are: Length, 397 ft. over all, 50 ft. width of hull and a total of 88 ft. over the guards. The new boat will have many decks, lower, main, saloon, gallery, hurricane, break, dome and domehouse being their several names.

A special type of vessel is not the only feature which the Long Island sound service has developed. There is a new paddle-wheel which is far ahead of the old one. It has blades, or buckets, that "feather," entering and leaving the water with the least possible resistance, and presenting their broadest pushing surface continually while submerged. The wheels on the new steamer are to be 80 ft. in diameter, each with twelve buckets 4 ft. wide and 13 ft. long.

The cruiser Tacoma, one of the Cleveland class, was launched at the Union Iron Works, San Francisco, a few days ago.

THEY STILL HAVE LABOR TROUBLES.

Differences between Employers and Workmen slow of settlement in British Ship Building Circles—Glasgow Shipping Letter.

Glasgow, June 1.—The engineers (machinists) are again working steadily in the marine engine shops, and the conduct of executive officials of the Amalgamated Society of Engineers (parent organization) in insisting upon the conduct of all business of the unions *on honorable lines is generally endorsed.* Trouble has, however, broken out in a new place—with the iron moulders. They were granted an extension for a month at the old rates in consideration of their having accepted a reduction some time before the general reduction was moved. The month is now up and the employers desire to apply the reduction to the iron moulders which has now been adopted in all the trades connected with ship building, but the iron moulders object and threaten to strike if the reduction is enforced. It is expected, however, that an arrangement will be come to until Aug. 1, when the wage question will be reopened in all the branches of labor, both in the ship yards and the engine shops.

But no sooner have the difficulties in the ship building trade in Scotland and on the northeast coast of England been adjusted than a similar case arises in the northwest of England, namely, in Barrow-in-Furness where are the extensive work of the Vickers Sons & Maxim Co., and who work in alliance with William Beardmore & Co., Ltd., Glasgow. The Barrow employers wished to make an equivalent reduction in wages to that adopted on the Clyde, though they deferred action longer. The men objected and asked for local conference. At the local conference no agreement was arrived at and reference has been made to a conference of the executive councils of the Employers' Federation and of the Allied Trade Unions. The decision will doubtless be the same as in the other cases, but in the meantime the Barrow men are leaving the matter in the hands of their officials and are continuing at work.

PROPOSED LEGISLATION OF INTEREST TO SEAMEN.

The report of the departmental committee of the board of trade on the mercantile marine (presided over by Sir Francis Jeune) has been laid upon the table of the house of commons. The committee had to inquire, among other things, into the causes that have led to the employment of a large and increasing proportion of foreigners and "Lascars" in the British merchant service; the sufficiency of the law and practice for securing proper food and other comforts for seamen on British merchant ships; the prevalence of desertion and other offenses against discipline. Upon these subjects, as a consequence of their inquiry, the committee has made a number of representations, and special interest attaches to their remarks as to the employment of foreigners and Asiatics. They have been able to make no very sweeping suggestion, but they consider that "Lascars" and other Asiatics who are British subjects stand on a different footing from "foreigners," and hold that "on the whole the objections which may be felt to the employment of foreign seamen do not apply to British subjects of Asiatic origin." On the other hand, it is held that superintendents should be given power "to forbid the engagement of any foreign seamen who do not possess a knowledge of the English language sufficient for the understanding of orders." It is not suggested that any ban should be placed on the signing-on of English-speaking foreigners in British ships. The other recommendations of the committee, mainly intended to conduce to the greater comfort of the men of the merchant navy and the maintenance of discipline, are: The employment of a properly certificated cook on every foreign-going vessel of 1,000 tons gross register, and over. The extension of the present system of inspection of ships' provisions by power being given to the board of trade to inspect in any case in which they think fit the provisions of any vessel whose probable voyage exceeds twenty-one days' duration. Power to be given to the board of trade to withhold the continuous discharge certificate of any seaman who wilfully fails to join a vessel after signing articles. Efforts to be made to increase the numbers of the royal naval reserve, especially of stokers, on foreign-going vessels, by improved inducements and more active recruiting. A reference by way of appeal to a superintendent to be allowed to seamen in cases in which the master gives a bad character on discharge or "declines to report." Facilities to be given to foreign seamen who have served for four years on British merchant ships to become by an easy process without expense British subjects by naturalization. The establishment of a system of voluntary examination and certification of masters and officers in the elements of medical knowledge. The universal adoption in British ships of an improved, ample, and varied scale of provisions. The provision of as comfortable living quarters as can practically be given to seamen aboard ships. Every encouragement to be given to training ships and to the training of boys on merchant vessels, with the object of increasing the number of British seamen in the mercantile marine.

TENDERS FOR ARMORED CRUISERS.

Tenders for the three new first-class armored cruisers to be built under this year's naval programme will now be invited, the preliminary plans and specifications being ready. It is expected that the orders will be placed with builders so that work will be commenced in July. These ships are to be practically of the same type as the Duke of Edinburgh and Black Prince, now building at Pembroke dock yard and Thames Iron Works. Pembroke is to build another, the fourth to be laid down this year, and orders have been issued for the proceeding with this ship. When the Commonwealth was launched in ten months from the laying of the keel the dock yard claimed that battleships had been launched from Davenport in seven months and from Portsmouth in nine months from the formal laying of the keel. This, however, is not correct, and the admiralty knows that from the date of the order private firms can do faster work, as was the case with the Commonwealth.

The ten submarine boats of this year's programme will be ordered from Vickers Sons & Maxim, Ltd., and while nine will be of the same type as those now being completed, in which many important improvements have been developed, the tenth will be an experimental boat embodying various proposals. The admiralty is, however, quite satisfied that the submarine boat has passed the experimental stage.

The fifteen torpedo boat destroyers, instead of being all the subject of competitive designs and tenders, will be ordered by arrangement with firms who have similar vessels on hand after they have passed such vessels through their official trials. These boats are to be only of 25½ knot speed as compared with 30 knots in the preceding vessels. But the greater size and load carried, and the fact that the trial is of much longer duration, considerably increase the difficulties, and the preliminary trials of vessels prove this. It seems that with a change of propeller the 25½ knots will be maintained.

ANOTHER SHIP BUILDING COMBINATION.

With reference to the new ship building combine mentioned in my last letter, a meeting of the shareholders of Wigham-Richardson & Co., ship builders, Walker-on-Tyne, has been held at Newcastle to consider the proposal of the directors that that company should be amalgamated with C. S. Swan & Hunter, Ltd., ship builders, Wallsend. Mr. Wigham-Richardson presided, and explained the proposal, pointed out the advantages to the company and recommended confirmation of the scheme. The nominal capital of the amalgamated companies is to be £1,500,000, divided into 800,000 ordinary shares of £1 each and 700,000 cumulative 5 per cent. preference shares of £1 each. The consideration to be paid to Wigham-Richardson & Co. for all assets, good will, liabilities, and undertaking as per balance sheet of Dec. 31 last, excepting the amount of cash paid in dividends this year and the sum of £10,000 necessary for expenses of liquidation, but including shares acquired in the Wingrove Steamship Co., Ltd., in January last, was agreed at £364,250 in shares of the new company, namely 158,125 of 5 per cent. preference shares and 206,225 ordinary shares; and the consideration to be paid to the firm of Swan & Hunter was to be £564,750 partly ordinary and partly preference shares of the new company. The meeting unanimously confirmed the proposals. One of the purposes of the new company is to secure controlling influence in other neighboring concerns, and with that in view a proposal has been made which will enable it to acquire financial interest in the Wallsend Slipway & Engineering Co., and to have some control over that company's machinery output.

WIRELESS MESSAGES ACROSS THE OCEAN.

Mr. Marconi is reported to have said to a newspaper correspondent that it would be another six weeks before they were ready again to send and receive messages from America. He said:

"When the new transmitters are in working order we shall go on again. It is a mere detail and in no way effects the principle of wireless telegraphy, as to which all technical people have no doubt. I am going to Canada in July and then we shall start again."

Mr. Cuthbert Hall, managing director of the company, added:

"The connection has been re-established; in fact messages have come across. We are now making arrangements to prevent any recurrence of an interruption to the service. The whole thing was a piece of bad luck. Thousands of words had been sent before the 'Times' messages, and without any trouble. But though connection is re-established we cannot accept any public work until everything is complete."

OPPOSITION TO SHIP BUILDING REORGANIZATION.

Opposition has developed to the plan of reorganization of the United States Ship Building Co. as outlined in the last issue of the Review. The leader of the opposition appears to be Gustav Loeb of No. 26 New street, New York, who has issued a circular to the rest of the bondholders. In the circular he says:

"Holders of these bonds are asked to give up a first mortgage upon the ship building plants and properties of the United States Ship Building Co. and accept in lieu thereof non-cumulative preferred and common stock. They are also asked to consent that first lien be given on these properties to the present holders of the twenty-year 5 per cent. collateral and mortgage bonds, who now have but a second lien."

Mr. Loeb asks for a statement of what the promoters of the company have received and calls for a searching inquiry into its affairs.

A parliamentary paper, giving particulars of the shipping which passed through the Suez canal last year, shows that the net tonnage increased 424,573 over 1901 and 1,510,251 over 1900. The transit receipts were $20,744,004, the highest since the opening of the canal. Of the 3,708 vessels which passed through the canal 2,165 carried the British flag.

DELAWARE RIVER SHIP BUILDING.

Philadelphia, June 10.—The board of directors of the New York Ship Building Co. held a special meeting last Saturday afternoon at the company's offices in Camden, at which the following directors were present: Myron C. Wick, A. W. Mellon, S. A. Knox, J. Craig Smith and Capt. William G. Randle. Myron C. Wick tendered his resignation as vice-president of the company and it was accepted. Charles S. Hall, purchasing agent and superintendent of hull construction, was elected to fill the vacancy. De Courcy May was elected president to succeed the late Henry G. Morse and he announced the appointment of Vice-President Charles S. Hall as general manager. The vacancy caused by Mr. Hall's appointment will be filled within a few days. Resolutions of respect were adopted on Mr. Morse's death and it was decided to erect a memorial tablet at the ship yard commemorative of his services to the company. Mr. May, the new president, has been general manager of the company for the past two years. He is a native of Baltimore and was sent to Paris to prepare for the Ecobe Centrale, but did not enter the school, going instead to Scotland, just before the outbreak of the Franco-Prussian war. He was in the class of engineering in the University of Edinburgh and apprentice in the workshop of T. M. Tenant & Co., Leith. From there he went to the engineering department of Cunliffe & Dunlap, Glasgow, and subsequently became inspector in the Fairfield Co.'s yard, Govan, Glasgow. After about seven years abroad he returned to this country in 1876, and took charge of the office of G. D. Levitt, consulting engineer for Calumet & Hecla, Cambridge, Mass. He was assistant superintendent for the I. P. Morris Co. of Philadelphia for ten years, and engineer of the Cataract Construction Co. at Niagara Falls at the installation of its plant. Immediately prior to his engagement with the New York Ship Building Co he was general manager of the Dickson Manufacturing Co., Scranton, Pa. The new vice-president, Charles S. Hall, is a cousin of the late Mr. Morse. Mr. Hall was connected with the Edgemoor Bridge Works for sixteen years, during nine of which Mr. Morse was president of the company. Part of the time Mr. Hall was manager of the company and superintended the erection of some of the largest bridges in the country. He is a resident of Woodbury, N. J. President May, accompanied by his private secretary, J. P. Tweed, left for Washington Monday morning on official business.

The one-story brick addition at the Camden yard for the use of draughtsmen is practically completed. A force of men who had temporary quarters over the mold loft are now quartered in the new building and work on the plans for the new cruiser Washington is being steadily prosecuted. The foundation for the large addition to the storehouse has been laid; the iron work and brick for it are on the grounds and the work of erection will begin at once. New blacksmith shops are being planned to be erected on land north of the main building. These shops will be large and are to be built in order to make more room for the boiler shops. Orders are expected at these works for two more oil steamers of the 625-ft. class. Keel blocks for the new cruiser Washington have been laid and the keel itself will be laid the latter part of this month. It was the late President Morse's wish that in the construction of the Washingon a record would be created that would remain for a long time. It is the intention of the new officials of the company to carry out his wish if possible. The company's plant now occupies 141 acres of land, with 3,600 ft. of water front on the Delaware river. The recent visit of President Morse to New York, it is said, was in reference to establishing a steel manufacturing plant on the Gloucester City side of the yards. The news that this company is almost sure to construct one of the new 16,000-ton battleships has infused new life into the ship building community, and it is certain, with the large amount of work on hand and in sight, that both day and night forces of men will soon be employed. With the completion of the new shops additional hands will be taken on at once. The oil barge Mahoning, built for the J. M. Guffey Co., was launched last Saturday, with Miss Gladys Lockhurst, daughter of Capt. Lockhurst of the Atlantic Transport Line, sponsor. The Mahoning is 130 ft. long 23 ft. 4 in. beam, 9 ft. depth of hold and has capacity of 110,000 gallons. The Neshannock, a sister barge, will be launched within two weeks.

The Wm. Cramp & Sons Ship & Engine Building Co. has issued a statement of its earnings for the fiscal year ended April 30, 1903, together with its assets and liabilities. The gross earnings were $8,518,169 and the "total gross profit" was $696,497 from which was deducted $113,866 for general expenses and legal services. Taxes, interest and insurance consumed $282,233, leaving net earnings of $300,397. Two quarterly dividends required $121,200, and $179,197.12 was transferred to the profit and loss account, which, at the end of the year amounted to $4,322,803, compared with $4,143,606 the previous year. The plant is valued at $12,577,821 and the total assets are fixed at $15,531,405. The total liabilities, including the $4,848,000 of capital stock, are $11,208,602. This leaves a surplus in assets of $4,322,803. During the year the vessels completed had a total tonnage of 70,174. The report closes by calling attention to the June 25 meeting of the stockholders, at which the question of approving the recent loans made by the company will come up for discussion and approval.

The Philadelphia & Reading Railroad Co.'s new steel ferryboat Ocean City, built at the Neafie & Levy works had her trial speed test on the Upper Delaware Saturday and fulfilled every requirement. The Ocean City is a sister vessel to the Cape May, also built at the Neafie & Levy works and which went into service last month. The Ocean City is 169 ft. over all; extreme width 55½ ft. She is built of steel and has all modern improvements. She will ply between Philadelphia and Kaighn's Point, Camden, in the seashore passenger traffic. She went into service Tuesday morning.

The Asbury Park, built at the Cramp works for the Central railroad of New Jersey for service between Rector street, New York, and Atlantic Highlands, left the Cramp yards last Saturday morning for New York. On the run up the coast Sunday she was given her official speed test and fulfilled every requirement. She has a stern built like a torpedo boat to allow of full speed over shoal places and makes twenty-five miles an hour. Edwin S. Cramp and a number of ship yard and railroad officials accompanied the flyer to New York.

The seven-masted steel schooner Thomas W. Lawson has been acquired by the Coastwise Transportation Co. of Boston. This company is composed of the owners of the various five, six and seven-masters which formed the "Crowley" fleet. For a community of interests these owners have gone into partnership, taking stock in the new company and turning over their ships and carrying their own insurance. John G. Crowley, general manager of the new company, says the statement that the Thomas W. Lawson is to be dismantled and converted into a barge is wholly untrue. He adds that the company is now building a new six-master of 6,500 tons, to be launched early in July and to be called the William L. Douglas. She is being built at the Fore River yards, Quincy, Mass.

The Baldt Steel Casting Co. was recently organized under the laws of Delaware with the following incorporators: J. J. Kennedy of New York; W. C. Turner, Overbrook, Philadelphia, and Frederick Baldt of Wilmington. The capital of the company is $300,000. The Brylgon Steel Casting Co. will build a $100,000 plant just outside Newcastle, Del., and alongside the Brylgon plant the Baldt company will erect works that will cost $250,000. The Baldt works will cover thirty-four acres of land, which was given to the company by the city of New Castle. It will be exempt from taxes for some years also. Anchors will be a part of the product of the Baldt company. George W. Baldt will be superintendent of the new works.

At a stockholders meeting last week at Wilmington, Del., Thomas H. Savery was elected president of the Pusey & Jones Co., vice C. W. Pusey. J. Parker Jeffries was appointed general manager and Andrew Spiegelhalter was appointed master mechanic, vice David Matchett, retired. It is understood the Puseys have retired from active interest in the company.

Governor S. W. Pennypacker, Senator M. S. Quay and Hon. Boies Penrose, the commission appointed by the Pennsylvania legislature to select a suitable silver service, to cost $25,000, for the cruiser Pennsylvania, to be launched at Cramps next August, awarded the contract June 2 to J. E. Caldwell & Co., jewelers of Philadelphia. The silver service selected will probably be the most elaborate carried by any American battleship. Every piece will be made from an original design and will be appropriately decorated with the state's coat of arms. Caldwell & Co. also made the silver services presented to the battleships Iowa and Kentucky.

Officials representing the government and the maritime and trade boards of Philadelphia held a conference last week on propositions looking to the improvement of the Delaware harbor and breakwater. The plan favored is to build an extension to the breakwater at a cost of $2,000,000. Another matter considered was to further contract the anchorage area and make the harbor a port of call.

The Midvale Steel Co. of Philadelphia has been awarded a contract by the government for twenty-four 8-in. nickel-steel guns and the Bethlehem Steel Co. of South Bethlehem, Pa., the contract for thirty 7-in. nickel-steel guns to be used to man three of the new 16,000-ton battleships. The contracts involve $1,000,000.

The training ship Yankee will leave League island on her first cruise in about two weeks with 350 sailors and 450 landsmen. By July 1 fully 2,000 naval recruits will be quartered at the naval camp at League island. About 3,500 men are still required in the navy to complete the 50,000 authorized by congress. Most of these will be recruited at League island.

A new coaling pier is to be built at the League Island navy yard at a cost not to exceed $47,000. The American Paving & Construction Co. of Philadelphia has just been awarded a contract to build a retaining wall on the Delaware river front of the navy yard, west of the new dry dock, that will cost $48,000.

At the annual meeting of the stockholders of the International Navigation Co. last week, in Philadelphia, the following directors were elected: W. H. Barnes, Clement A. Griscom, Samuel F. Houston, Francis L. Potts and James S. Swartz. The old officers were re-elected. No financial statement was issued.

Mayor Weaver of Philadelphia has appointed Charles H. Cramp, Joel Cook, Rodman Griscom, Edward T. Stotesbury and Henry G. Morse (since deceased) members of a committee of forty-eight representative citizens to prepare and arrange for suitable exhibits of the city of Philadelphia at the St. Louis exposition in 1904.

The Harrison Safety Boiler Works of Philadelphia, has an interesting exhibit of its products in the machinery department of the Philadelphia Bourse. So also has the National Water Tube Boiler Co. of New Brunswick, N. J., William M. Jackson, representative.

The Foundation & Construction Co. of New York, at $198,760, and the Atlanta Machine Works of Atlanta at $27,972.50,

will construct the government light house on the west side of Chesapeake Bay, about sixteen miles from Baltimore.

The McCanna adjustable thread cutting and milling tools, made by the John M. Rogers Boat, Gauge & Drill Works, Gloucester City, N. J., are being rapidly introduced into ship yards where they are meeting with favor.

Several vessels have lately used the new brazing metal "Ferrofix" for repairing fractures in different parts of their machinery and the metal gave such satisfaction that the American Brazing Co., South Fourth street, Philadelphia, is receiving many inquiries from abroad and home concerning its cost and merits.

Merritt & Co., Philadelphia, manufacturers of lockers made of expanded metal, also operate branch works at Camden, N. J. Several vessels on the Delaware are being fitted up with the company's metal lockers.

The New Jersey Asbestos Co., Camden, is manufacturing an asbestos metallic packing called "Gladiator" which has given excellent satisfaction on a large number of vessels that have used it.

ADVANTAGES OF TRIPLE SCREWS.

In an interview in Washington Rear Admiral George Wallace Melville last week spoke as follows regarding the advantages of triple screws:

"The triple screw is no novelty in naval construction. Russia possesses eleven naval ships fitted with triple-screw engines. France has ten battleships and nineteeen cruisers of this type and Germany, after a competitive trial of the twin and triple-screw systems, has practically decided to adopt the triple-screw design in the future in all warships of her fleet. England alone of the strong naval powers continues to design twin screws for her most powerful vessels.

"The official trials of the Columbia and Minneapolis, which are fitted with triple screws, when compared with those of the New York and Olympia, prove conclusively that there is decided economy of propulsion in ships of the former type. In time of war the ordinary cruising of the triple-screw warships can be maintained by the side engines while the center engine is run with just sufficient speed to clear its propeller. The economy of the triple-screw system has been shown by the experience of the French and German navies. Other advantages of the triple-screw system are: The engines can be made lighter, cheaper and simpler; the vibration of machinery is decreased, which is a substantial contribution to the comfort of the crew. In addition to economical and structural reasons for installing triple screws there are great tactical advantages to be obtained. In the German navy it was formerly believed investigation would show that tactical reasons would prevent the further use of triple screws in German warships, but when the Frederick III, fitted with triple screws, was pitted against the twin-screw ships Brandenburg and Sachsen in all manner of tactical evolutions, the Frederick III showed a marked superiority over her rivals.

"Last summer the Frederick III. and the Emperor William the Great, the Emperor William II. and the Emperor Babarossa made two long cruises, and it was reported that they were more easily steered in the maneuvers than the twin-screw warships. In passing through the Kiel canal, German triple-screw warships made speeds which had never been dreamed of with twin-screw ships. The triple-screw system is such that the ship can be well controlled, even if the rudder is swept away. The triple-screw system for high-powered naval vessels is neither an innovation nor an experiment; it is a military necessity. The continued installation of twin screws for such vessels is not only against progressive designs, but fails to meet with military and practical requirements of the future. If such practice continues our naval prestige will be lessened."

SHIP BUILDING IN BRITISH COLUMBIA

Vancouver, B. C., June 5.—Although some fears have been expressed of late regarding the continuance of prosperous business conditions along the Pacific coast, there has been more stir in shipping lines in this district during the past few months than for a long time past. The British Columbia Marine Railway Co., operating plants for the construction and repair of ships here and at Victoria, have had a large volume of business, necessitating the purchase for the Victoria branch of a great deal of modern machinery, such as pneumatic tools, punches, shears, lathes, planers and drill presses. The company hopes during the coming year to install a similar plant here. In Esquimalt they are constructing a large wooden steamer for the Canadian Pacific Railway Co. for their coast trade. She is to be named Princess Beatrice. The Princess Victoria, built in England for the same company, is being fitted out here with her housework. She is destined for the Victoria-Vancouver ferry route and is a 17-knotter.

The British Columbia Salvage Co., with headquarters at this place, is an organization closely related to the Marine Railway Company. The salvage company has the steamer Maude equipped with all facilities for getting gear out to a wreck in short notice—heavy boom, steam winch, etc.—and the barge Isabel, 150 ft. long, containing large water tank, boilers, pumps, diving gear and moveable tackle, such as slings, chain, rope, etc. Included in the equipment are three new 10-in. steam-driven centrifugal pumps, one new 6-in. steam-driven centrifugal pump, one large duplex pump, three large portable boilers, a steam donkey engine and complete gear for three divers. This is the only salvage company in Pacific Canadian waters.

PLANT FOR HANDLING AND STORING COALS.

The Link-Belt Engineering Co. of Philadelphia recently installed at the works of the Maryland Steel Co., Sparrow's Point, Md., a most interesting plant for the handling and storing of soft coal. The plant in question consists of one of their circular storage systems having a capacity of 50,000 tons and operating in conjunction with a crushing, elevating and conveying system handling 1,000 tons of coal in ten hours. The outfit has been in successful operation for over two months. The coal storage was made necessary by the completion of a 200-ton by-product plant, built from designs furnished by the United States Coke & Gas Co. of New York. The ovens are arranged in four batteries, each set of two batteries being served by a coal bin holding 1,000 tons. The ovens are capable of coking eight tons of coal each twenty-four hours, so that 1,600 tons of coal are required each day. In deciding upon a suitable coal handling equipment the Maryland Steel Co. submitted the following requirements:

That a storage of 50,000 tons of coal be provided for.

That the plant be capable of receiving coal from four cars simultaneously.

The plant to have a minimum capacity of handling, crushing, elevating and distributing into the two overhead bins 160 tons of run-of-mine bituminous coal per hour.

That the reduction in size of coal be from run-of-mine to 1 in. and under.

The plant adopted as meeting all of these requirements consists of one of the Dodge Coal Storage Co.'s circular systems of storing coal, employing a swinging 280-ft. span, equipped with electrically-operated hoisting mechanism, a 2-ton clam shell bucket, moving gear, and other appurtenances. The storage system is so arranged that it will receive coal simultaneously from two cars, and will distribute it by means of the automatic bucket to any part of the storage area. When reloading the coal is taken from stock by the automatic bucket and delivered directly, through suitable chutes, to the conveying system. The conveying system itself employs four steel track hoppers, located on two tracks, which are 37 ft. apart, the track hoppers being equipped with feeding gates which automatically deliver the coal in proper quantities to inclined scraper conveyors which in turn deliver it to the crushers. Before entering the crushers the coal is passed over bar screens, which remove all material that is smaller than 1 in. The arrangement of screens and chutes from scraper conveyors to the crusher is such that coal can be delivered from either conveyor into either crusher. The crushing rolls are two in number and of exceedingly massive construction. The rolls themselves are 46 in. in diameter, 36 in. wide and are provided with fluted surfaces. The rolls are operated differentially, so as to give a grinding effect, and the product is passed from the rolls to elevators. Each scraper conveyor, each crusher and each elevator has a capacity of 160 tons per hour, so that in case of a breakdown on either side the required capacity can still be handled. The bucket elevators are of the V-bucket type, with buckets 4 in. long, 24 in. wide and 12 in. deep, attached at intervals to heavy steel-bushed steel-link roller chains. The elevators are about 90 ft. high and deliver overhead into a 30-in. belt conveyor, which distributes the coal through a suitable self-propelling tripper into the two coal bins.

The belt conveyor is about 250 ft. centers and has a capacity of about 320 tons per hour, so that it will receive all the coal that both elevators, operating simultaneously, can deliver to it. The belt conveyor employs a woven cotton belt, made especially for conveyor purposes, this belt having proved considerably more durable in practice than the standard types of rubber belt or the cotton layer belts. The troughing of the belt is exceedingly shallow, the purpose being to make the belt as flat as possible without sacrificing the capacity and thus avoid the exceedingly rapid deterioration which the belt undergoes when deep troughing is resorted to. All the machines are operated by independent direct-current motors, wound for 250 volts.

In an interview given out in Paris this week Senator Elkins of West Virginia says that he intends to introduce in congress at the next session a bill reducing by 10 per cent. the duties on goods brought to the United States in American ships or increasing by 10 per cent. the duties on goods brought in foreign ships. He expects that the measure will have strong support as a result of the failure of the shipping bill in the last congress. Mr. Elkins, of course, claims, as all advocates of discriminating duties have claimed, that his proposed measure is not open to the same objections as the shipping bill, as it will develop American shipping without the expenditure of a cent, large or small ships receiving the same benefits.

The government is now building at the navy yard at Portsmouth, N. H., a wooden brig to cost $50,000, to be used for the purpose of training landsmen. The brig will be 126 ft. over all, 108 ft. keel, 30 ft. beam and 10 ft. deep. On a mean draught of about 9 ft. 6 in. she will have a displacement of about 350 tons. The vessel will be constructed in general of yellow pine planking and white oak timber. Accommodations will be provided for the commanding officer and two commissioned officers in the deckhouse built on the poop deck, this house being provided with three staterooms. The vessel's sail, rigging and outfit will be very complete. It is expected she will be in commission next spring.

TRIAL TRIP OF A MODERN FERRYBOAT.

New York, June 9.—The new double-decked, double-screw ferryboat Syracuse, built by the W. & A. Fletcher Co. of Hoboken, N. J., for the New York Central & Hudson River Railroad, for use in its West Shore service, between New York and Weehawken, had her trial trip on Thursday last, and she demonstrated her ability to make faster time than any craft of her kind plying in or about the waters of New York harbor, and at the same time added one more testimonial to the superiority of the propeller over the side wheel style of ferryboat.

The Syracuse is 208 ft. long over all and 178 ft. between perpendiculars; beam over all, 66 ft.; beam moulded, 40 ft.; depth amidship at side, moulded, 18 ft. Her hull is of steel, and was built by T. S. Marvel & Co. of Newburgh, N. Y., while the joiner work was done by Wm. Rowland. The boat is built after the model of the West Point, which was designed by Mr. J. W. Millard, naval architect of 32 Broadway, New York, and which before the advent of the Syracuse had the reputation of being the fastest ferryboat in the country. The two boats will be in service on the same West Shore ferry from the foot of Franklin street, North river, New York, to the West Shore railroad station at Weehawken, N. J., and will lessen the former time considerably between those points. The boat has the usual wagon ways and cabins for men and women on the main deck, with general saloon on the upper deck. The cabins and saloon are commodious and handsomely finished in cherry, the decorations being from designs by Mr. Samuel Huckel, Jr., the architect of the new Grand Central station at Forty-Second street and Madison avenue, New York.

The propelling equipment includes two Scotch boilers, 12 ft. 9 in. by 12 ft., each having three Morison corrugated furnaces. The engines, made in the shops of the W. & A. Fletcher Co., are double compound with two high pressure cylinders 18 in. diameter and 28 in. stroke, provided with piston valves and Stephenson double bar links and valve gear. They are connected together on line of shafting, which extends the entire length of boat, with steel propeller wheel at either end, the forward wheel pulling while the aft wheel pushes when the boat is under way. The boilers and engines are built for a working pressure of 140 lbs. to the square inch. The air pump and jet condenser are of the Blake vertical twin type, with steam cylinders 12 in. and air cylinders 25 in. diameter, with piston stroke of 18 in. The engine room is also furnished with Blake fire and feed pumps. The electric light plant consists of two engines and two dynamos of General Electric make, installed by the Western Electric Co., and of 250 light capacity. The heating and ventilating plant was furnished by the B. F. Sturtevant Co., and consists of large steam heaters with blower, which will furnish either fresh, hot or cold air as required to cabins and saloon.

On the trial trip, which was witnessed by a number of invited guests, the Syracuse was in charge of Capt. J. B. Brannigan of the West Shore service, assisted by Wheelman F. H. Penny, the two manning the pilot house, while the engine room was in charge of Engineer D. O. Smith, with J. McQueen as assistant.

Shortly after the boat left her moorings at the Fletcher works a vigorous attack by healthy appetites was made on a sumptuous luncheon provided for the occasion. The first sail was up the Hudson to a little above Spuyten Duyvil, when the course was changed down stream, and when opposite Weehawken the engines were slowed down almost to a standstill.

What's the matter?" asked several on board.

"Going to race the West Point," someone replied, and added "Just waiting for her to come out of her slip on trip down."

And soon she came, plowing through the water like a locomotive through a slight snow drift, throwing the spray from her prow in a perfect stream. The Syracuse ranged alongside and the test of speed was on. For the first few rods it looked as though the West Point was going to keep her laurels as the fastest ferryboat afloat, but when the Syracuse got under full headway she began gradually to gain on her antagonist.

"Hooray! We're beating her!" shouted an enthusiast aboard the Syracuse, and others took up the cry with:

"Let her out Captain!"

"Hurrah for the Syracuse!"

"We're it!"

Everybody aboard seemed as interested as though a fortune to him depended on winning out. Just like all boat races, when everyone aboard makes winning or losing a personal matter. From opposite Weehawken to a point opposite the foot of Jay street, New York, in a run of fifteen minutes the Syracuse gained a length or more on the West Point. Then she slowed up and awaited the up trip, and when the West Point got fairly under way for Weehawken another test of speed was made with similar results, and everybody voted the Syracuse the new record-maker for ferryboats, the tests both up and down stream, with and against the tide, proving her superiority.

After a trial of two hours the boat made a landing at the Forty-Second street pier of the West Shore ferry and the happy guests, after congratulating the builders and owners, and thanking Mr. S. Taylor, manager of the Fletcher company, for the enjoyable outing, dispersed their several ways.

That the Syracuse, while built on the same model in every respect as the West Point, is the faster boat only goes to show that their builders, the W. & A. Fletcher Co., are not satisfied to let well enough alone, but are ever striving to do better and to improve if possible on former work. This is all the more to their credit from the fact that the house enjoys the reputation of building the engines for the fastest boats on the Hudson, such as the New York and Albany of the Hudson River Day Line, and other fast craft on the great lakes and in various parts of the country, and have only their own record to beat.

Among those present at the trial were the following officials of the marine department of the N. Y. C. & H. R. R.; Walter B. Pollock, manager; Capt. George J. Eiseman, superintendent; Fred. Pollock, assistant superintendent; Frank Ward, chief engineer and B. C. Fessenden, superintendent of ferries; also Fourth Vice-President Cartensen of the railroad. Among invited guests were E. E. Olcott, president of the Hudson River Day Line; W. F. Hermann of Cleveland, general passenger agent of the Cleveland & Buffalo Transit Co.; John Cherry, superintendent floating equipment, Erie Ry.; Capt. Harvey, superintendent Hoboken Ferry Co.; T. C. Pollock, assistant general freight agent Pennsylvania Co.; J. A. Benson, chief engineer, department docks and ferries of New York; W. J. Burlee of Burlee Dry Dock Co.; Thomas Drum of New Jersey Dry Dock Co.; James Clark, chief engineer, marine department, B. & O. R. R.; Com. H. B. Moore; W. I. Babcock; Harry Joyce, president Manhattan Literage Co.; Palmer Campbell, manager Hoboken Land & Improvement Co.; F. L. DuBoise, assistant engineer Pennsylvania Co.; Stephen Ransom; Samuel Huckel, Jr.; C. F. Matlage; Vice-President Irving, National Bank; Com. Mike Moran; M. F. Frame; Herbert Calkins; David Chalmers; Wm. H. Bailey; Geo. E. Weed; G. Foster Howell; C. E. Lambert; R. E. Wescott; Capt. George Norton; W. H. Wiley; Mayor Klein and Messrs. Listman, Rathsford and Wolf of Syracuse; M. D. Fletcher; M. D. Fletcher, Jr.; Wm. H. Fletcher; Harry M. Fletcher and S. Taylor, while the insurance interests were represented by Messrs. Lethbridge, Barnett and Wm. H. Eiseman.

ELIMINATING SUBSIDIARIES AT SAULT STE. MARIE.

Mr. Cornelius Shields, president of the Consolidated Lake Superior Co., has just given out an interview in Ottawa, in which he states that the company is to undergo another reorganization by eliminating a number of the subsidiary companies and incorporating them as departments of the Consolidated Lake Superior. He says:

"It has been decided to do away with a number of the subsidiary companies and to incorporate them as departments of two principal companies. The two principal companies will be the Lake Superior Power Co. and under it will be included all companies that have received charters from the Dominion government, and the Consolidated Lake Superior Co., in which will be all the companies that were granted charters from the governments of different states. The special charter is only to apply to the subsidiary companies on which there is not any bonded debt. It is expected that by the new arrangement the management of the entire companies as a unit will be rendered much more simple. It was found that the parent company with fifteen subsidiary companies was pretty difficult to manage. The Canadian government has signified its intention of granting the special charter."

Mr. F. H. Clergue, who is at present in Montreal, says concerning this latest move:

"What was needed most at the Sault was a man whose practical general knowledge would enable him to take charge of all the various works and run them as the unit. We had all the specialists we needed, but we did not have anyone whose experience would enable him to assume general direction. Anyone who understands the real nature of the works knows that it is only by binding each department close to one another that they can all be worked out successfully. From the progress that has been made during the past few months we are convinced that we have found such a man in Mr. Cornelius Shields. He has been very careful about any changes that he has made and all have benefited the company a great deal. I do not think a better man could have been secured anywhere. Mr. Shields has made a most favorable impression with the directors, with the heads of the various departments and the heads of the government. The outlook was never better than at the present time."

Mr. Yarrow, the celebrated English ship builder, comes out strongly against the submarine boat as a war craft. He says he has no faith whatever in the submarine boat, either for offensive or for defensive purposes. He does not think that anything practical will ever result from the experiments which all maritime nations are making in this direction. Submarines, if entirely successful or otherwise, would be of use only against stationary vessels. For the purpose of attacking vessels in motion they could not be guided, he maintains, with sufficient accuracy and knowledge to be relied upon, while even if they could, at least so much has been accomplished already by torpedo boats with far less risk and cost.

From a statement recently issued by the imperial statistical office it appears that on Jan. 1, 1902, the German commercial fleet consisted of 3,959 vessels with 2,080,548 register tons, and a total crew of 43,946 men. Vessels of less than 18 tons register are not included in these figures. Hamburg and Bremen together possess eleven steamers each of over 10,000 tons. During the last ten years the total increase in the number of ships constituting the commercial fleet has been 8 per cent. whereas that of the tonnage has been 50 per cent.

R. M. Leathers, Astoria, Ore., has just begun work on a steamer 66 ft. long for G. W. Hume.

NEWS OF THE GREAT LAKES

LAKE FREIGHTS—IRON ORE MOVEMENT.

No doubt the lake vessel men who took all the contract ore that was offered to them on the 85-cent basis from the head of the lakes, and all the coal they could get at 40 and 50 cents to Lake Superior and Lake Michigan ports respectively, are just now quite well pleased with their action in this regard. Some of them managed to fill up almost to the limit of their capacity, and at these rates for the season the vessels of the larger class will show a very fair profit, notwithstanding the delays, both in loading and unloading, which have probably been worse during the past ten days than at any time in the past. The contract rates "look good," as the term goes, not on account of any great decline as yet in the so-called wild freight market, but from the manner in which the ships, constantly increasing in number, and all of the new ones of the largest kind, have demonstrated their ability in the face of the worst delays in port ever known, to show immense gains over all previous records in the amount of freight moved. The simple note that in shipments of 863,559 gross tons during May from Two Harbors, one of the several ore-forwarding ports, the average cargo was 6,000 net tons (even figures), is sufficient to show the influence of the growing fleet of modern big cargo carriers on the lake trade in general.

The only decline in freights since the opening of navigation has been a cut of 5 cents in the ore rates, but another cut is threatened, and this is why the outlook is not encouraging. Large gains in ore and coal shipments with far less grain to move than was expected is the explanation. On June 1 the ore shipments from all upper lake ports aggregated 4,521,576 gross tons, compared with 5,148,137 tons on the same date a year ago, a decrease of 626,561 tons, but this loss in ore, due to a later opening of navigation than in 1902, was more than made up in the coal movement, which shows a gain to Lake Superior ports alone of 705,409 net tons over 1902 shipments. It is also true, as shown by the Sault canal reports, that the movement of freight of all kinds on June 1 was as a whole fully up to last year, notwithstanding the later opening of navigation.

Of course everybody connected with the lake trade is disposed to look for a great increase every year, but the pace has been so great that there are some fears as to another smashing of records this year, and therefore uneasiness regarding the freight market. The policy of the Steel Corporation regarding wild freights this year is surprising. In the past two years they have made the contract rates and maintained them in day-to-day charters throughout the season. This year, although they probably have as much, if not more, vessel capacity under contract than at any time in the past, they have taken off 5 cents from the contract rates on recent wild charters and another cut of 5 cents is not unlooked for. This would seem to work into the hands of certain independent ore interests who are competitors of the big organization and who have practically no vessel capacity under season charter.

CAUGHT UP WITH LAST SEASON.

Enormous Freight Traffic to and from Lake Superior—All Records Broken in the Past Month's Business at the Sault Canals—Very Heavy Coal Shipments.

All the loss in lake traffic due to navigation having opened much later this year than in 1902 has already been more than made up. This is shown by reports of Lake Superior commerce as prepared by canal officials at the Sault. The Lake Superior business is, of course, a fair measure of the whole lake trade. On June 1 the freight that had passed to and from Lake Superior through the canals (Canadian and United States) aggregated 6,839,856 net tons, compared with 6,764,893 tons to the same date a year ago, showing a gain of 74,963 tons for this year. In other words the loss in Lake Superior traffic during April of this year (it amounted to 687,395 tons) was fully made up in May, which proved the greatest month in the history of the canal, the freight movement aggregating 5,188,017 tons. The increase in coal shipments is a most striking feature of the report. Coal has been going forward since the opening of navigation at a rate that must certainly soon crowd the docks at upper-lake ports if the movement is kept up. On June 1 of this year the shipments of bituminous coal to Lake Superior ports footed up 1,403,728 tons, a gain of 463,083 tons over the same date a year ago, while shipments of anthracite, aggregating 238,847 tons, show a gain of 142,326 tons. During the entire season of 1902 the shipments to Lake Superior were 4,507,530 tons of bituminous and 309,948 tons of anthracite. Of course more coal will be needed this year, as the docks were completely cleaned up on account of the coal strike of last year, but the present rate shipments is very heavy.

A few comparisons make the great May traffic of the canals all the more interesting and vivid. In the year 1881 the total traffic for the entire season of navigation was 1,567,741 net tons and in 1891 it was 8,888,759 net tons, while for the single month of May, 1903, the traffic reached the total of 5,188,017 net tons. This record, as has been stated, is the largest in the history of the canals. Another comparison is that of the port of Liverpool, which during the entire twelve months of 1902 passed 3,000,000 gross tons—less than the traffic of a single month at Sault Ste Marie and not the best month at that. Of course the Liverpool traffic is made up of all kinds of merchandise, much of it highly valuable, while the great bulk of freight passing at the Sault is iron ore, coal and grain, of low value compared with the Liverpool freight and readily handled in great bulk cargoes.

Summaries of the Sault traffic to June 1 for three years past are contained in the following tables:

Movement of Principal Items of Freight to and from Lake Superior.

ITEMS.	To June 1, 1903.	To June 1, 1902.	To June 1, 1901.
Coal, anthracite, net tons	238,847	96,521	107,168
Coal, bituminous, net tons	1,403 728	940,645	360,086
Iron ore, net tons	4,024,205	4,458,312	1,172,532
Wheat, bushels	15,347,163	18,761,176	5,959,542
Flour, barrels	1,353,078	1,570,438	921,573

Report of Freight and Passenger Traffic to and from Lake Superior, from Opening of Navigation to June 1 of Each Year for Three Years Past.

EAST BOUND.

ITEMS.	To June 1, 1903.	To June 1, 1902.	To June 1, 1901.
Copper, net tons	18,890	18,780	8,996
Grain, other than wheat, bushels	5,865,364	3,094,500	2,811,928
Building stone, net tons		7,101	4,280
Flour, barrels	1,353,048	1,570,438	921 393
Iron Ore, net tons	4,024,205	4,458,312	1,172,532
Iron, pig, net tons	130	4,440	2,689
Lumber, M. ft. B. M	160,612	176,957	87,792
Silver ore, net tons			
Wheat, bushels	15,347,163	18,761,176	5,959.542
Unclassified freight, net tons	15,459	10,348	4,098
Passengers, number	4,611	4,850	2,949

WEST BOUND.

Coal, anthracite, net tons	238,847	96,521	107,168
Coal, bituminous, net tons	1,403,728	940,645	360 086
Flour, barrels	30		180
Grain, bushels			23,530
Manufactured iron, net tons	18,775	20,294	7,942
Salt, barrels	88,568	104,223	99,346
Unclassified freight, net tons	89,505	106,391	63,347
Passengers, number	4,893	5,974	3,842

Summary of Total Freight Movement in Tons.

	To June 1, 1903.	To June 1, 1902.	To June 1, 1901.
West bound freight of all kinds, net tons	1,763,849	1,179,458	553,864
East bound freight of all kinds, net tons	5,076,007	5,585,435	1,694,181
Total freight, net tons	6,839,856	6,764.893	2 248,045

Total number of vessel passages to June 1, 1903, was 3,785 and the registered tonnage 5,575,513.

A GREAT TWO HARBORS RECORD.

Duluth, Minn., June 10.—Notwithstanding the fears that are expressed regarding the iron ore business of the present season, the movement of the past month from the head of the lakes, especially the port of Two Harbors, is enormous. The report of M. T. Hannon, dock agent of the Duluth & Iron Range road at Two Harbors, shows shipments of 863,559 gross tons (967,183 tons of 2000 lbs.) in the month of May. A striking feature of the Two Harbors shipments is the average cargo, 5,330 gross tons, showing the great increase in size of vessels now engaged in Lake Superior ore trade. This average of 5,330 gross tons, with the addition of 1 per cent., which the vessel carries without pay on account of moisture, means just 6,000 tons of 2,000 lbs. In one 10-hour day last week 876 cars of ore, about 27,000 gross tons, were unloaded into the docks, thus breaking all previous records for such work.

The Duluth, Mesabi & Northern road, which in spite of the purchase of several heavy locomotives for road and hill service, is short of power, has leased several from the Algoma Central, and these are being delivered from Sault Ste. Marie.

M. F. Plant of New York, principal stockholder of the Canada Atlantic & Plant Steamship Co., which owned and operated the steamer Halifax, running between Boston and Charlottetown, has sold out to Boston men, who also take over all the other property of the company.

CANADIAN SHIPPING NOTES.

Kingston, Ont., June 10.—It is not at all probable that either of the recent tenders for a Canadian fast Atlantic service, which are probably referred to at some length in the Review this week, will be accepted. Proposals were made by only two companies, Allan and Dominion, the latter a part of the Atlantic shipping combination, and both were conditional. The call was for a fortnightly service at 16 knots and a fortnightly service at 21 knots, and the bid of the Dominion Line was £200,000 a year while that of the Allan Line was £300,000. The method of calling for tenders was not satisfactory and the offers received are not what was expected. One point, however, is made clear by the Allan Line tender, and that is that the company does not favor the running of 21-knot steamers on the Gulf and River St. Lawrence. When the people get to realize that a 21-knot service to Montreal is impossible we may expect to have tenders asked for on a proper basis.

The National Association of Marine Engineers in Canada is pressing the government to do away with temporary certificates and to require all engineers, except on private yachts and on tugboats having an engine of less than 5 H. P., to be certificated. The owners of steamers on the minor inland waters, while not opposed to having certificated men on their boats, find difficulty in getting their men qualified under existing regulations and desire that these be amended in their interests. In Newfoundland the government has found it expedient to raise the qualifications and the new regulations went into force June 1.

Three new steamers, J. H. Plummer, H. M. Pellott and A. R. Ames, built in Great Britain for the Canadian Lakes & Ocean Navigation Co., have reached Montreal from Antwerp with steel rails and are proceeding to Port Arthur at the head of Lake Superior to unload. The cargoes are consigned to Mackenzie, Mann & Co. for the Canadian Northern Ry. These are the first vessels loaded in Europe to go to Port Arthur without breaking bulk.

J. A. Cuttle of the Montreal Transportation Co. reports that to June 2 his company had carried 1,250,000 bu. more grain than last year. This increase, he says, is due to the removal of the canal tolls, and he adds that if Port Colborne was properly equipped the increase would be much greater.

A new steamer, the Westport, launched recently at Shelburne, N. S., has been towed to Yarmouth, N. S., to be engined. She has accommodations for 150 passengers and 100 tons of cargo and is intended for the St. John and Westport run.

It is understood that the Dominion government has decided to loan a further sum of $3,000,000 for harbor equipment to the Montreal harbor commissioners. The steel sheds which it is proposed to erect will alone cost $2,500,000. The terms of the loan and the work which it will cover have not yet been determined.

There were launched last week at Parrsboro, N. S., a 400-ton schooner, Scotia Queen, for Cochrane & Soley, and a 300-ton schooner, Silver Leaf, for Capt. S. Salter.

W. L. Waring, Dominion inspector of steamship boilers and machinery for New Brunswick and Prince Edward island, died at St. John, N. B., June 1.

Montreal harbor commissioners have decided to add an electrical equipment to the big elevator under construction for them.

GEOLOGICAL HISTORY OF THE GREAT LAKES.

Mr. G. K. Nichols of the United States geological survey has this to say regarding the geological history of the great lakes in the annual report of the Smithsonian Institute:

The history of the great lakes practically begins with the melting of the Pleistocene ice sheet. They may have existed before the invasion of the ice, but if so the drainage system is unknown. The ice came from the north and northeast and spreading over the whole Laurentian basin invaded the drainage districts of the Mississippi, Ohio, Susquehanna and Hudson. During its wanderings there was a long period when the waters were ponded between the ice and the uplands south of the Laurentian basin, forming a series of glacial lakes whose outlets were southward through various low passes. A great stream from the Erie basin crossed the divide at Fort Wayne, to the Wabash river. A river of the magnitude of the Niagara afterwards flowed from the Michigan basin across the divide at Chicago to the Illinois river and still later the chief outlet was from the Ontario basin across the divide at Rome to the Mohawk valley.

The positions of the glacial lakes are also marked by shore lines, consisting of terraces, cliffs and ridges, the strands and spits formed by their waves. Several of these shore lines have been traced for hundreds of miles, and wherever they are thoroughly studied it is found that they no longer lie level, but have gentle slopes towards the south and southwest. Formed at the edges of water surfaces, they must orginally have been level, and their present lack of horizontality is due to unequal uplift of the land. The region has been tilted towards the southwest in grades ranging from a few inches to 3 or 4 ft. to the mile. The epoch of glacial lakes, or lakes partly bounded by ice ended with the disappearance of the ice field and there remained only lakes of the modern type wholly surrounded by land. These were formed one at a time and the first to appear was the Erie. It was much smaller than the modern lake, in fact only about one-sixth in size. The next great lake to be released from the domination of the ice was probably Ontario. Before the Ontario valley held a land-bound lake it was occupied by a gulf of the ocean. In the extreme northeast, in the vicinity of the Thousand islands, the marine shores are nearly 200 ft. above the present water level, but they descend southward and westward and towards the western end of the lake must be submerged several hundred feet. This condition was of short duration and the rising land soon divided the waters, establishing Lake Ontario as an independent water body.

There is some reason to think that the upper lakes—Huron, Michigan and Superior—were at first open to the sea so as to constitute a gulf, but the evidence is not so full as could be desired. They were at first a single lake instead of three and the outlet, instead of being southward from Lake Huron was northeastward from Georgian bay, the outlet river following the valleys of the Mattawa and Ottawa to the St. Lawrence. Extensive studies of its shore line have been made. This line, called the Nipissing shore line, is not wholly submerged like the old shores of Lakes Erie and Ontario but lies chiefly above the present water surfaces. It has been recognized at many points about Lake Superior and the northern parts of Lakes Huron and Michigan and measurements of its height shows that its plane has a remarkably uniform dip at 7 in. per mile in a south-southwestward direction.

The lake history is characterized by a progressive change in the attitude of the land, the northern and northeastern portions of the region becoming higher, so as to turn the waters more and more towards the southwest. The latest change from Lake Nipissing to Lakes Superior, Huron and Michigan, involving an uplift at the north of more than 100 ft., has taken place within so short a period that we are naturally led to inquire whether it has yet ceased. It is not probable that the land is still rising at the north and the lakes are still encroaching on their northern shores. J. W. Spencer, an active explorer of the shore lines of the glacial lakes is of the opinion that the movements are not complete and predicts that they will result in the restoration of the Chicago outlet of Lake Michigan and the drying of Niagara.

These slow changes of mean water level are concealed from ordinary observation by the more rapid and impressive changes due to variations of volume, but they are worthy of consideration in the planning of engineering works of a permanent character and there is at least one place where their influence is of moment to a large community. The city of Chicago is built on a smooth plane little above the high water level of Lake Michigan. Every decade the mean level of the water is an inch higher and the margin of safety is so narrow that inches are valuable. Already the older part of the city has lifted itself several feet, to secure better drainage, and the time will surely come when other measures of protection are imperatively demanded.

Looking to the more distant future we may estimate the date at which the geographic revolution prophesied by Spencer will occur. Near Chicago is an old channel made by the outlet of a glacial lake. The bed of the channel at the summit of the pass is about 8 ft. above the mean level of Lake Michigan and 5 ft. above the highest level. In 500 or 600 years (assuming the estimated rate of tilting) high stages of the lake will reach the pass and the artificial discharge by canal will be supplemented by an intermittent natural discharge. In 1,000 years the discharge will occur at ordinary lake stages and after 1,500 years it will be continuous. In about 2,000 years the discharge from Lake Michigan-Huron-Erie, which will then have the same level, will be equally divided between the western outlet at Chicago and the eastern at Buffalo. In 2,500 years the Niagara river will be an intermittent stream and in 3,000 years all its waters will have been diverted to the Chicago outlet—the Illinois river, the Mississippi river and the gulf of Mexico.

DECLINE IN AMERICAN SHIP BUILDING STOCKS.

In the past two weeks a marked decline has taken place in stocks of the American Ship Building Co., especially the common stock. Common shares have sold as low as $37.50. Not long ago these shares were up to $63. The preferred, which had sold up to $110 or $111, is down to par. Of course all stocks are low and the great decline of late in the New York market has affected securities all over the country. A rumor of discontinuance of the common dividend probably has something to do with the depression in the common stock, but nothing has been said by the management that would indicate discontinuance of this dividend. Decline in the stock is also attributed to fear of trouble with the men in the ship yards and to the fact that the outlook for the building of new vessels is not what it has been for two or three years past. Nothing has been said or done by the management of the company to which the decline in the stocks might be attributed.

It is announced at Albany that another test will shortly be made of electric motors for hauling boats on the Erie canal. Two motor cars are being made at Schenectady by the General Electric Co. and Superintendent of Public Works Boyd has authorized the test. Poles are to be erected for a mile and a half along the Erie and an experimental system is to be installed. There are three rails to the system, one above the other. One electric mule or car will run on the lower rail, guided by the rail above, upon which another car will be run in the opposite direction. The cars are small and each will be operated by a man. The cable will be stretched from the car to the boat.

NORTHWESTERN GRAIN SITUATION.

Duluth, Minn., June 10.—Shipments of grain from the head of the lakes were small last week, amounting to not more than 445,000 bu. all told. Of this 253,000 bu. were wheat, and 160,000 bu. flax. Receipts of grain are a little more liberal, and country marketings are freer, but there is such a scarcity of milling wheat at Minneapolis that the tide of grain should go that way for the rest of the summer. There is at Minneapolis actually not enough wheat to run the mills, even at the slack speed now in force, more than four to five weeks, and receipts are only fair, so that there is much doubt of any material increase in stocks at the head of the lakes available for eastern shipment. Receipts at Canadian upper ports are not large, and it is generally conceded that the Manitoba and Assiniboine country is pretty well cleaned of its last fall crop. The Canadian Northern has handled so far this season, crop of 1902, about 3,500,000 bu., and is looking for very little more. There are about 2,500,000 bu. of wheat in store at Port Arthur and Fort William, the former Canadian Northern, the latter Canadian Pacific. In the western tributary country there is about 8,500,000 bu. more, most of which will come over the C. P. R. This is only about 1,000,000 bu. in excess of the corresponding date last year, although the crop was very much larger in 1902.

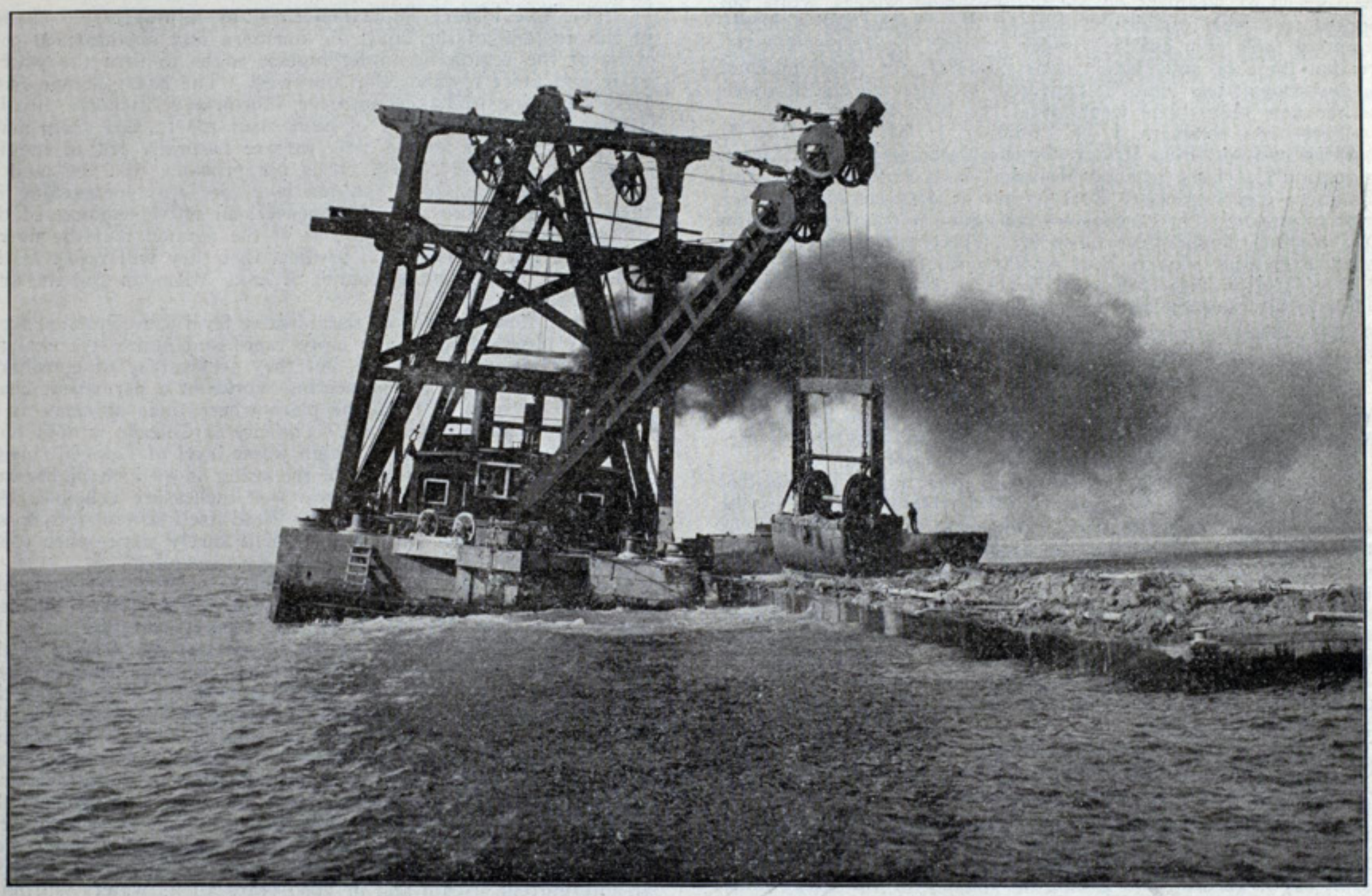
The late fall will probably see a large movement to all Lake Superior shipping ports, both American and Canadian, for there never was a crop that looked better, and there never was such an acreage as now, on either side of the international boundary. It is early and fine, and all the available land is in crop. In acreage wheat is very much in excess of last year, flax is less, barley and oats are far ahead of any previous year, and from present appearances all are simply magnificent.

INJUSTICE OF THE NEWSPAPER.

Human nature is much the same as it was in the days when Le Sage wrote Gil Blas. Civilization is only a veneer and culture a sort of polish; the primary instincts lie beneath unchanged. Nowhere do the contemptible strains of human nature break out more clearly than in the columns of a newspaper. The newspaper is an especially cruel thing. Death loves a shining mark and the newspapers glory to dissect a prominent character. Mr. Francis H. Clergue has been a most successful man. He has brought into existence a group of industries which, were it not for him, would probably not have had an existence for a score or more of years. With an inspiration that is born of genius he perceived an opportunity to found an industrial empire at the outlet of Lake Superior, making a mill pond out of the largest body of fresh water in the world and securing continuous power so long as the present geological formation of the earth shall obtain. This one fact alone exhibits the possession of a mind of the highest type. The command of capital to work out plans such as these are qualities of another order, but Clergue appears to have possessed both to an extraordinary degree. He has conceived and created a gigantic group of industries. Nothing can ever rob him of this fact. Latterly the condition of the company's finances have been such as to make it advisable to put a new man in as general manager. The result is that certain newspapers are determined to degrade Mr. Clergue and are unkind enough to say, or to permit others to say, that he has outlived his usefulness. Mr. Clergue is the largest stockholder in the Consolidated Lake Superior Co. and is a resident director at the Sault. Undoubtedly the group of industries will be managed along the lines laid down by their originator and under his watchful eye.

IMMENSE CLAM-SHELL DREDGE.

A dredge of great dipper capacity, used in the construction of the breakwater of which Buffalo is so proud, is illustrated on this page. Part of the Buffalo breakwater is a timber crib structure filled with stone. Owing to the unstable material forming the lake bed where the timber crib structure is located it was not deemed advisable to place the crib work directly on the same. Instead a trench was excavated down to bed rock. The trench was 50 to 60 ft. wide on the bottom and from 80 to 100 ft. wide on top. The bed rock in many places was 70 ft. and over below the water surface. As the ordinary dipper dredges are unable to dig in such a depth of water, a dredge of the kind shown in the illustration was built. It is undoubtedly one of the largest and most efficient dredges ever operated on the great lakes. The clam, or bucket, has a capacity of 10 cu. yds. and weighs over 30,000 lbs. The resulting trench is filled with sand and gravel up to the level of the original lake bottom, and furnishes thus an unyielding foundation for the rubble stone layer and superincumbent cribs.



Immense clam-shell dredge used in building Buffalo breakwater. Bucket is of 15 tons capacity.

The Buffalo breakwater, which is one of the largest and finest in the world, has been fully described and illustrated in these columns.

On Saturday the steamer Saxonia, last of three 6,200-ton steamers which the American Ship Building Co. has had under way for some time past for G. A. Tomlinson of Duluth, was launched at the old Globe yard, Cleveland. Mr. Tomlinson visited Cleveland for the purpose of witnessing the launch, as did also Mr. J. A. McGean, now president of the American Linseed Co. and formerly in charge of Bessemer fleet of steamers on the lakes. These gentlemen were accompanied by their wives and were joined by a party of Cleveland friends bent upon making the launch a pleasant affair. The steamer was christened by Miss Kate Lyman, daughter of Mr. Henry F. Lyman of the Upson-Walton Co. The Saxonia is 436 ft. over all, 416 ft. keel, 50 ft. beam and 28 ft. deep. She will have triple-expansion engines with cylinders of 20, 33½ and 55 in. diameter and 40 in. stroke, supplied with steam from two Scotch boilers 13 ft. 2 in. in diameter and 11½ ft. long, fitted with Ellis & Eaves draft. Capt. D. P. Crane, who was master of the steamer F. Schlesinger, will sail the Saxonia.

SOME DOUBTS IN IRON ORE CIRCLES.

Duluth, Minn., June 10.—Mr. L. W. Hill, assistant to the president of the Great Northern Ry. and in direct charge of the road's ore traffic, says he does not look for as heavy an ore movement as was anticipated, and that his road, which had figured on moving 6,000,000 tons from the Mesabi range will not do so much by considerable. Mr. Hill thinks the country is unsettled by the Northern Securities decision and by the position in which it places combinations of capital in almost every line, and he believes the immediate future rests largely with the party "that gets into court first." "If the Northern Securities decision stands," said he, "you and I can make more money by going round stirring up cases against organizations of capital, from the Pennsylvania and B. & O. roads to the wholesale jobbers' associations and the retailers' little combinations, than in an- other way. The whole country is a mass of combinations of one kind and another, and they come under this law even more than the Northern Securities."

But doubt as to the future of the ore trade seems not dependent so much on the issue of combinations as on other and simpler facts, one of which is that in an effort to get stocks ahead at low prices more ore was taken down last year than was needed, and there is no particular incentive with prices higher, as they are, for a continuance of that policy. Most mining men and shippers at the upper end of the lakes look for a lesser, or no greater, movement of ore than last year.

There is as much, indeed more, exploration than before, and there is as sharp demand for ore properties as ever. Few sales are taking place, for the simple reason that few deposits are being shown, and those few slowly. There is a widening of the exploration into fields long idle and into others that have never been explored. This is true not alone of the Lake Superior region but of others all over the country. Recent inspections made from this city of supposedly valuable ore lands in lower California, and in central upper California, have been discouraging. In lower California the ore is poor and water is absent. In some places in upper California the ore, while it looks magnificent on the surface, soon degenerates into a sulphide, while in others the ore is heavily titaniferous, which, reports to the contrary notwithstanding, is as yet too refractory for reduction economically. In southwestern Utah, where are enormous outcroppings of excellent ore, almost the entire field is held by interests that propose utilizing it themselves, chief among which is the Colorado Fuel & Iron Co. This company's operations in iron ores elsewhere are of such a nature that the Utah fields are very acceptable at this time.

There is a revival of exploratory work on the northern side of the international boundary north of Lake Superior by American ore users. The Michipicoten district is written down, though it is probable that in some of its newer explorations the Clergue syndicate has very large deposits, and work that was to have been taken up in some fields south of the lake has not started. The southern Wisconsin ore fields in Sauk county are looking well, and the Deering Harvester Co. has just now closed a lease on 400 acres and has paid $30,000 in advance royalties. Others are working there also, and it is claimed that 10,000,000 tons of all grades has been shown up by the several companies. This is, probably, an over-statement. Mesabi explorations are slower than in any past year. It is quite evident that this range has been pretty well explored. Future ore bodies are liable to be small and to be found more accidentally than in the recent past, and almost entirely on land already explored more or less thoroughly and perhaps several times.

AROUND THE GREAT LAKES.

A chart in colors of Oswego harbor has just been published by the United States lake survey. It may be had from the Marine Review.

The steamer Empire State, while lying at her dock at Kingston last week, was nearly destroyed by fire. She is owned by Folger Bros.

The barge S. J. Tilden has been purchased by the Great Lakes & St. Lawrence River Transportation Co. and will be placed in the coal trade between Oswego and Quebec.

Blown up by a charge of dynamite is the end of the old barge Bahama. She sank while loaded with stone that was to be used by Hughes Bros. & Bangs in breakwater work at Buffalo.

At the works of the Empire Ship Building Co., Buffalo, a few days ago, a steel fuel lighter for Stanley B. Smith & Co. of Toledo was launched. The lighter is 166 ft. long and cost $15,000.

It is reported that the steamer J. C. Suit, owned by Capt. A. R. Sinclair of Duluth, has been sold to Schlosser Bros. of Chicago for service on a new route between Chicago, South Chicago and Indiana harbor.

Capt. Joseph Lampoh of the Steinbrenner fleet, Cleveland, has again taken command of the steamer Henry Steinbrenner and has turned over to Capt. Harry Gunderson of the Steinbrenner, the steamer Anna C. Minch, which has just gone into commission.

Capt. James Clarke, one of the oldest vessel masters of Lake Michigan, dropped dead of heart failure at Racine this week. Capt. Clarke had been associated with the lake trade for over forty years. He served as city marshal of Racine for three terms and was prominent politically.

Probably the largest cargo ever moved by a vessel of the so-called Canadian canal type was taken on at Escanaba recently by the steel steamer Kanawha. The Kanawha took 3,575 gross or 4,004 net tons from Escanaba to South Chicago. She was built by the Jenks Ship Building Co. of Port Huron, and is owned by F. Chesbrough of Emerson, Mich.

In an attempt to rescue his wife from death in the harbor of St. Joseph last week, Capt. John D. Bean lost his life. Bean was aboard his schooner, the Avery, when she was struck by the steamer Puritan. Bean's wife was thrown overboard and he jumped after her, thinking to rescue her. He was caught by the hull of the Puritan and crushed to death against the wharf.

Capt. A. C. Reimers of the Cleveland-Cliffs Iron Co.'s schooner Chattanooga, was instantly killed on the ore docks at Ashtabula Saturday. While going ashore to report arrival of his vessel he found it necessary to climb over a train of cars. He is supposed to have fallen between the cars when they were suddenly set in motion. Capt. Thomas Kemmett succeeds Capt. Reimers in command of the Chattanooga.

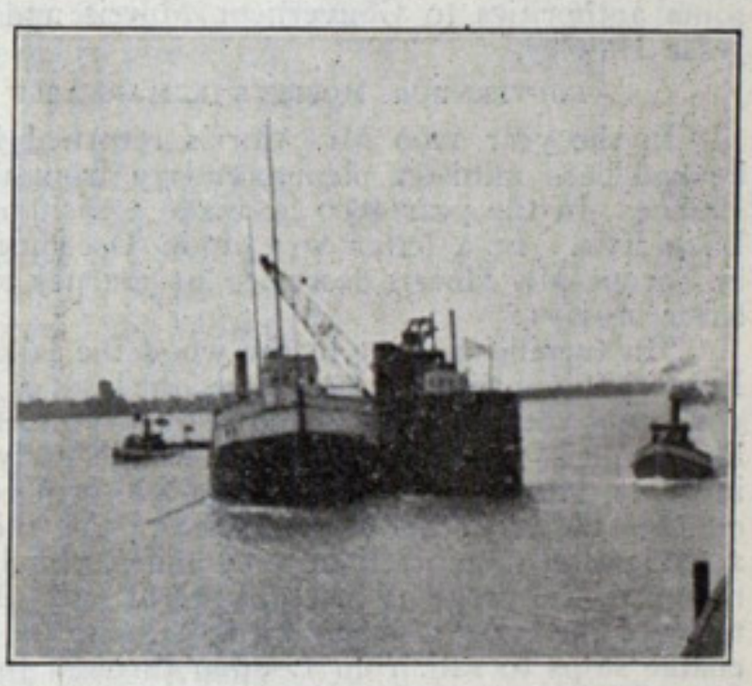
The Detroit River Iron Works (Geo. C. Symington and Arthur Henderson), 665-667 Atwater street, east, Detroit, has just delivered a very fine little engine for Mr. Walter H. Oades' yacht Ivy. It is triple expansion with cylinders of 6½, 10½ and 17 in. diameter and 10 in. stroke, to work under 250 lbs. pressure and turn 400 revolutions a minute. The engine will develop about 160 H. P. and is expected to drive the boat about 19 miles an hour.

Franklin Bros. & Morris of St. Paul, Minn., were the lowest bidders on a job of pile revetment work at Two Rivers, for which Major J. G. Warren, United States engineer, opened bids June 3. Totals of their bids were: White pine lumber, $16,556.40; Douglas or Oregon fir, $16,667.40; longleaf yellow or southern pine, $16,798.40; Norway pine, $16,314.40. Other bidders were Adolph Green of Green Bay, Wis.; P. W. Galloway of Racine, Wis., and Chas. H. & Herman Greiling of Green Bay, Wis.

Mr. L. P. Smith of L. P. & J. A. Smith, Cleveland, who have the contract for all of the piling, dredging and dock building of the new $1,500,000 ship building plant of the Great Lakes Engineering Works on the Detroit river front below the River Rouge, says that despite exasperating delays in delivery of material for the construction of the ship yard, a berth for the building of the first steel steamer will be ready July 1, which is fifteen days earlier than expected. Of course the keel for a vessel may be laid considerably in advance of the completion of the ship yard.

STEAMER PARKS FOSTER AGROUND.

The steamer Parks Foster, in trying to make a landing at Thompson's dock on Friday morning, May 28, went aground on the shoal running out from the dock. The Foster had been in Lake Huron all the forenoon, having her compass adjusted, and had run back to put Compass Adjuster Fields ashore. The tug Colton worked on her until 4:30 p. m., without success. Then a new scheme was tried. The tug went down the river a little ways and came up between the dock and the steamer at full speed, and by this method the steamer was swung a quarter of a point. Anchors were then run and the lighter Newman sent for. The Newman arrived at 10 o'clock May 30, and commenced lightering at once. The Foster was released at 4:15 p. m. and dropped over in Sarnia bay to reload her cargo.



Lightering the Parks Foster.

SAULT CANAL CELEBRATION.

The Scientific American in its current issue has an article on the semi-centennial celebration of the breaking of ground for the first canal at Sault Ste Marie, Mich. All the dignitaries of the state and nation were there according to the writer and the occasion was altogether a joyous one. Which proves that the best of newspapers may be deceived by their correspondents. There was to have been a celebration of the semi-centennial anniversary on June 4, but as congress failed to appropriate the necessary amount and as the appropriation of the state of Michigan was contingent upon a national appropriation the celebration had to be postponed until 1905, when the semi-centennial of the opening of the canal will occur. It is not likely one of the masters of the steamers that filed through the canals on Thursday last knew that fifty years ago on that very day Charles T. Harvey had driven a spade into the earth and had removed the first shovelfull of dirt from what has since become the greatest canal in point of commerce in the world.

A brake for stopping ships, invented by L. Lacoste, of Ottawa and which was given trial on the government steamer Eureka, has been considerably improved and is now said to be quite a success.

HISTORY OF THE ERIE CANAL.

The people of the state of New York will vote at the election to be held next November upon the advisability of expending $101,000,000 upon the improvement of the Erie, the Oswego and the Champlain canals. The object of this proposed great undertaking is to insure the port of New York the continuance of the commercial supremacy which it has enjoyed since the foundation of the government and to the state the reflex benefits which will follow. The business of the port of New York still largely exceeds that of any port in the United States, but it has been conclusively shown that it is falling off year by year, and that its loss has been the gain of Boston, Philadelphia, Baltimore and Newport News. The loss in tonnage of recent years has been so alarming as to threaten in the no far distant future the port's supremacy, and it was the fears born of this showing which so aroused the commercial organizations of New York city that they started an agitation for canal improvement which resulted in the adoption by the legislature of the proposition for the $101,000,000 expenditure on the state's waterways. This expenditure will make the Erie and Oswego canals capable of floating barges of 1,000 tons and thereby, at least so it is confidently predicted by those who have given the question careful study, put these arteries of traffic in a condition which will enable them to contend for business with the railroads, thus securing to the port of New York the advantage of as low rates of transportation as are made by the railroad companies to rival ports.

Large as the expenditure proposed appears to be, it is less in proportion to the resources of the state than that which brought the canals into existence. Under the original canal project adopted by the legislature in 1810 the expense of the Erie canal was estimated at $5,000,000 and that of the Champlain canal at $1,000,000. At the time when the state embarked on the undertaking its whole revenue was only $819,299.29, and its total population was only 929,220. Now the state has a revenue of $23,000,000, all of which is derived from indirect taxation, and a population of over 7,000,000.

The construction of the Erie canal from Albany to Buffalo was begun in 1817 and completed in 1825. There is some question as to who is entitled to the credit for the conception of the project. A canal by the Oneida lake route, the present route of the Oswego canal, was proposed by Gov. William Tryon to the Earl of Dartmouth in a report which he sent to England in 1774. As early as 1791 the Western Inland Lock Navigation Co. had been incorporated for the purpose "of improving the Mohawk, and thence across the Rome summit and down Wood creek to Lake Ontario." The first suggestion of the Erie canal is attributed by some authorities to Gouverneur Morris and by others to Mr. Jesse Hawley.

GOUVERNEUR MORRIS'S REMARKABLE PROPHECY.

In the year 1709 Mr. Morris returned from Europe, where he had been minister plenipotentiary from the United States to France. In the year 1800 he made a visit to Niagara Falls and Lake Erie. In a letter written in December, 1800, to a friend in Europe Mr. Morris describes his journey to Fort Erie. In this letter he says:

"In turning a point in the wood the lake broke on my view. I saw riding at anchor nine vessels, the least of them 100 tons. Can you bring your imagination to realize the scene? Does it not seem like magic? Yet this magic is but the early effect of victorious industry. Hundreds of large ships will in no distant period bound on the billows of these inland seas. At this point commences a navigation of more than 1,000 miles. Shall I lead your imagination to the verge of incredulity? I will. Know then that one-tenth of the expense borne by Britain in the last campaign would enable ships to sail from London through the Hudson river into Lake Erie; as yet, my friend, we only crawl along the outer shell of our country, the interior excels the part we inhabit in soil, in climate, in everything. The proudest empire in Europe is but a bauble compared to what America will be, must be, in the course of two centuries, perhaps of one."

The first legislative proceeding relative to the construction of the Erie canal was a resolution introduced on Feb. 4, 1808, to explore and survey the country between Lake Erie and the Hudson for the purpose of ascertaining "the most eligible and direct route for a canal between the tidewaters of the Hudson and Lake Erie." The resolution was presented by Joshua Forman, the member from Onondaga. The resolution was not carried, but it appears that $600 was appropriated, and that Mr. James Geddes, an engineer, made a running level of the whole route and discovered various important facts connected with the general subject of his inquiries. The project appears to have slept in the profoundest repose until the suggestion of Thomas Eddy, De Witt Clinton and Jonas Platt once more called it from its slumbers. In March, 1810, Judge Platt, then a senator, offered a resolution that Gouverneur Morris, Stephen Van Rensselaer, De Witt Clinton, Simeon De Witt, William North, Thomas Eddy and Peter B. Porter be appointed commissioners to explore the whole route and take surveys. The resolution was seconded by Mr. Clinton and passed unanimously. The survey was made and the commissioners made a report setting forth the practicability of the canal and its ultimate advantages. It was determined to seek assistance from congress as well as from the states which were immediately to be benefited. The legislature of Massachusetts passed resolutions commending the project. In the winter of 1809 Mr. Forman made a journey to Washington for the purpose of conversing with President Jefferson on the subject of congressional aid for the canal. Mr. Jefferson, after listening to Mr. Forman's glowing description of the advantages of the undertaking and the reasons which ought to induce congress to promote it, replied:

"It is a very fine project and might be executed a century hence. Why, sir, here is a canal of a few miles, projected by Gen. Washington, which, if completed, would render this a fine commercial city, which has languished for many years because the small sum of $200,000 necessary to complete it cannot be obtained of the general government, the state government, or from individuals, and yet you talk of making a canal 250 miles through a wilderness. It is little short of madness to think of it at this day."

JEFFERSON ANTICIPATED BY A CENTURY.

In a letter addressed by Mr. Jefferson to Gov. Clinton in 1823 he says, in respect to inquiries regarding the conversation which he had with Mr. Forman thirteen years previous. "Many, I dare say, think with me that New York has anticipated by a full century the ordinary progress of improvements." Mr. Jefferson upon the near prospect of the completion of the canal regarded it as a phenomenon in economy not easily accounted for. "This great work, says he, "suggests a question both curious and difficult as to the comparative capability of nations to execute great enterprises. It is not from greater surplus of produce, after supplying her own wants, for in this New York is not beyond some other state. Is it from other sources of industry additional to her produce? This may be. Or is it moral superiority? A sounder calculating mind as to the most profitable employment of surplus by improvement of capital instead of consumption? I should lean to this latter hypothesis, were I disposed to trouble myself with such investigations; but at the age of eighty it would be idle labor."

The war of 1812 suspended for a while all proceedings with regard to the canal. At the conclusion of the war, many of the former friends of the canal project appeared to be entirely discouraged. But the enthusiasm of Mr. Eddy, Judge Platt and Mr. Clinton was unabated. In 1815 a meeting of the advocates of the canal was held and the result of the meeting was a memorial from the pen of Mr. Clinton which by the amplitude of its information and the force of its argument made great numbers of converts.

At the session of the legislature in 1816, however, the uttermost that the friends of the canal could obtain was a vote of $20,000 for completing the surveys. Martin Van Buren was among the number in favor of postponing the undertaking, and he had great influence in securing a vote of the senate to that effect. The friends of the project in the assembly, who were in favor of going ahead with the undertaking, very reluctantly acquiesced in the vote of the senate. In the spring of 1817, the next year, Mr. Van Buren's views changed, and he gave the project his hearty indorsement. The first decisive act of the legislature for commencing the work was passed in April, 1817. What followed shows that legislative tactics were much the same in those days as those who have had recent experience in promoting canal legislation have had to contend with. The act, having passed both branches of the legislature, was in danger of being lost in the council of revision, an institution since wiped out on account of its many iniquities. Judge Platt, in a communication to Dr. Hoosack, gives a particular history of the bill in council. "Powerful and appalling obstacles," says he, "were presented in the honest doubts and fears of many sensible and prudent men." After relating the opinions of particular members of the council, he says:

"Near the close of the debate Vice-President Tompkins came into the council chamber and took his seat familiarly among us. He joined in the argument, which was informal and desultory. He expressed a decided opinion against the bill, and among other reasons he stated that the late peace with Great Britain was a mere truce; that we should undoubtedly soon have a renewed war with that country, and that instead of wasting the credit and the resources of the state in this chimerical project we ought immediately to employ all of the revenue and credit of the state in providing arsenals, arming militia, erecting fortifications, and preparing for war. 'Do you think so, sir?' said Chancellor Kent. 'Yes, sir,' was the reply; 'England will never forgive us for our victories on the land and on the ocean and on the lakes; and my word for it, we shall have another war with her within two years.' The chancellor, then rising from his seat, with great animation declared: 'If we must have a war or have a canal I am in favor of the canal, and I vote for this bill.' His voice gave us the majority, and so the bill became a law."

LABORS OF DE WITT CLINTON.

In Dr. Hoosack's "Life of De Witt Clinton" he remarks that though many distinguished men had embarked in the project and promoted it with their utmost influence, yet from Mr. Clinton's position in the state he seems to have more entirely involved his popularity and political standing than any other, and had the strongest claims to credit for the undertaking's success. He was, however, the subject of envy and abuse, and, when the canal was nearly completed on April 12, 1824, the two branches of the legislature passed a resolution removing Mr. Clinton from the board of canal commissioners. For fourteen years Mr. Clinton had held the position of a commissioner of canals. His removal from the canal board awakened indignation throughout the state. Public meetings were called all over the state to denounce the action of the legislature in removing him. The result was that Mr. Clinton was again called to the chief magistracy of the state

by a majority which was then unparalleled in the state's history. The completion of the canal was made the occasion of a great jubilee. An arrangement was made for a succession of fetes from Lake Erie to New York city. The following account of the celebration is taken from Dr. Hoosack's "Life of Clinton":

"Gov. Clinton, attended by some of his friends, and those of the great national work, the completion of which was to be celebrated, was to enter the canal from Lake Erie and meet assemblies of citizens on successive days at different points and join them in festivities, attending public addresses and celebrating the epoch with the pomp of processions and ceremonials that might suitably express the feelings of generous triumph and gratulation which animated every bosom. But to prevent any disappointment, in case the work should not be completed at the time anticipated, and also to give some sensible signal that all of the people along this line of more than 500 miles were participating with each other in these triumphant gratulations, a line of cannon was formed from point to point within hearing distance along the whole of the route from Buffalo to New York city. A signal was fired the moment the boat entered the canal from Lake Erie, and this signal was answered and transmitted through the whole of the line, and again repeated and transmitted back from New York to Lake Erie, where, three hours after the first signal was given, it was announced that it had been acknowledged and returned through the whole distance. The procession of boats left Buffalo on Oct. 26, eight years and four months from the time of breaking ground at Rome on July 4, with ceremonies and addresses appropriate to the beginning of so great a work. The procession arrived at New York city on Nov. 7. All circumstances concurred to make this celebration as gratifying and joyous as it was pompous and splendid. Every bosom glowed with the sentiment of generous pride and grateful exultation, and the expression of humble religious gratitude, uttered by the organs of the public voice, at the successive festivals, were responded to with heartfelt sincerity by the assembled multitudes. No lurking envy or captious exceptions and doubts, or sinister forebodings of warning voices, disturbed the harmony or damped the general enthusiasm. It was a celebration worthy to be the last scene of so great a work."

The accounts which are given in the newspapers which chronicled the ceremonies which attended the advent of Gov. Clinton's party to the cities along the route of the canal and the Hudson show that Dr. Hoosack did not exaggerate the feeling of pride which the people of the state took in the completion of the project.

The boats first used on the canal carried only 30 tons, but they were gradually enlarged to a capacity of 75 tons. In 1835 the legislature authorized the enlargement of the canal. This improvement was begun in 1836 and completed in 1862. The dimensions of the canal after this enlargement were: Surface width, 70 ft.; bottom width, 56 ft.; depth, 7 ft. This canal is practically the canal of today. The only effort of importance to improve it since the enlargement completed in 1862 was under the $9,000,000 appropriation made in 1895, and it is now generally agreed that as far as practical benefit was concerned this expenditure was a waste. Today the canal accommodates boats 98 ft. long, with a 17½ ft. beam and drawing 6 ft. of water. These boats have a carrying capacity of from 240 to 250 tons.

It is proposed to enlarge the Erie and Oswego canals so that they will have a minimum bottom width of 75 ft. and a minimum depth of 12 ft. They will accommodate boats 120 ft. long, 25 ft. in width, and of 10 ft. draught. These boats will have a cargo capacity of 1,000 tons, which will mean 33,333 bu. of wheat. The Champlain canal will be able under the proposed improvement to accommodate boats having a carrying capacity of 250 tons.

The original cost of the Erie canal proper was $7,143,789, or over $2,000,000 more than the original estimate. Its enlargement in 1836-62 cost $44,465,414. Of the $9,000,000 appropriated for canal improvement in 1895 $6,833,390 was spent upon the Erie. Up to and including the appropriation made in 1895 the total cost of constructing and improving the Erie, Oswego and Champlain canals, as the friends of the canal figure, has been about $118,000,000. The revenues up to 1882, when the tolls on the canals were abolished, amounted to $131,907,634.

For many years the commerce of the canals has been steadily dwindling, owing to the improvement made in railroad transportation. The contention of the canal improvement advocates is that the 1,000-ton barge project will bring the canals up to such a state of efficiency that the advantage will be in their favor as against the railroads, and that the advantage of the competition which will thus be engendered will not only give to New York city the commerce which has been deflected from it to other ports, but will promote industry throughout the state to such an extent that the benefits derived will cause the state to take similar strides in prosperity to those which it took by reason of the original canal improvement.

TENDERS FOR CANADIAN SERVICE.

Tenders for the new Atlantic mail service were laid before parliament at Ottawa last week. The government called for a service of two vessels at 21 knots and two of 16 knots, a fast and a moderately-fast steamer to run alternately. Two tenders were received. The Dominion Line, in the name of the British & North Atlantic Steamship Co., asks for £200,000 a year and the Allan Line £300,000. Both tenderers make reservations. The Dominion Line says:

"In making up our estimate we have assumed that in fixing the maximum rate of passage for emigrants going to Canada under arrangement with the Canadian government, such maximum rate of passage will permit of the steamer receiving £5 per adult, for the conveyance of such passengers. We also assumed that the Imperial and Canadian governments would pay the ordinary sea passage rate for the carriage of mails forwarded by these steamers. We also assumed that we should have the assistance of the Canadian government, in making and would be able to make satisfactory arrangements with the Canadian railways for the securing and forwarding of freight and passengers from and to any Canadian port, and that these arrangements would secure to these services not less favorable treatment than any other of the most favored steamers using such port. If we are wrong in these assumptions, or should fail to make the satisfactory arrangements contemplated in the last paragraph, we should need to revise the amount of our tender."

The Allans, in submitting their offer, say: "The routes to be as specified, except that we reserve the option of running the 21-knot steamers to Halifax all the year round, instead of to Quebec in summer. Provision to be made for the annual overhauling of the mail steamers."

Neither tender exactly meets the ideas of the government, as shown in the call for tenders. It is possible neither will be accepted.

PROGRESS OF NAVAL CONSTRUCTION.

In the monthly summary of naval construction, issued by the bureau of construction and repair, fair progress is again shown in work on the large vessels. The contest between the New York navy yard and the Newport News company as regards the duplicate battleships which they are building, Connecticut and Louisiana, again shows 3 per cent. progress for each, the same as in April. The summary follows:

Name.	Building at	Degree of completion. Per Cent. May 1.	June 1.
	Battleships.		
Missouri	Newport News Co.	91	93
Ohio	Union Iron Works	73	75
Virginia	Newport News Co.	28	32
Nebraska	Moran Bros. Co.	19	20
Georgia	Bath Iron Works	25	28
New Jersey	Fore River Ship & Engine Co.	34	37
Rhode Island	Fore River Ship & Engine Co.	34	37
Connecticut	Navy Yard, New York	7	10
Louisiana	Newport News Co.	9	12
	Armored Cruisers.		
Pennsylvania	Cramp & Sons	48	50
West Virginia	Newport News Co.	50	52
California	Union Iron Works	26	28
Colorado	Cramp & Sons	53	55
Maryland	Newport News Co.	47	49
South Dakota	Union Iron Works	26	28
Tennessee	Cramp & Sons	0	0
Washington	New York Ship Building Co.	0	0
	Protected Cruisers.		
Denver	Neafie & Levy	90	91
Des Moines	Fore River Ship & Engine Co.	85	86
Chattanooga	Lewis Nixon	72	73
Galveston	Wm. R. Trigg Co.	66	66
Tacoma	Union Iron Works	71	77
Cleveland	Bath Iron Works	95	97
St. Louis	Neafie & Levy	17	18
Milwaukee	Union Iron Works	16	19
Charleston	Newport News Co.	35	39
	Torpedo Boat Destroyer.		
McDonough	Fore River Ship & Engine Co.	99	99
	Torpedo Boats.		
Stringham	Harlan & Hollingsworth Co.	98	98
Goldsborough	Wolff & Zwicker	99	99
Blakely	Geo. Lawley & Son	99	99
Nicholson	Lewis Nixon	98	98
O'Brien	Lewis Nixon	98	98
Tingey	Columbian Iron Works	96	96
	Submarine Torpedo Boats.		
Plunger	Lewis Nixon	99	100
Porpoise	Lewis Nixon	99	100
Shark	Lewis Nixon	99	100
	Steel Tugs.		
Pentucket	Navy Yard, Boston	70	80
Sotoyomo	Navy Yard, Mare Island	13	20

A cable from Glasgow is to the effect that contracts for the two new Cunarders have been let—one to John Brown & Co., Clydebank, and the other to Swan & Hunter, Newcastle. The original design for these steamers has been changed. The beam has been increased and the displacement is to be 35,000 tons. The horse power is placed at 70,000 which, it is expected, will give the vessels a speed of 26 knots. The original estimated speed was 25 knots.

BARRACKS INSTEAD OF RECEIVING SHIPS.

The last link connecting the old navy and the new is on the point of being severed by the navy department. The receiving ships, which are relics of the age in which Farragut and Porter shone, have been condemned by the navy department and with authority of congress will be struck from the navy list. This action is due to the prevalence of contagious diseases among men quartered on the ships, and medical officers have reported that sanitary and hygienic reasons demand the abandonment of the vessels. In their place the department will propose the construction of permanent barracks at the navy yards at Boston, New York, League island, Norfolk and Mare island. It is expected that the cost will be about $2,500,000.

The whole country is intimately interested in the decision of the department for it and not the coast section, as in the old days, supplies the men who are transformed into men-of-war's-men. Recruiting officers now visit inland as well as coast cities and enlist men who have never smelt water and who, were it not for the opportunity of entering the navy, would not, in their lifetime, wander beyond the limits of the city or county in which they live. Recruits are at once sent to receiving ships, where they are taught to keep themselves clean, to stow their clothes properly, to sleep in hammocks and to comply with naval discipline. Having undergone this preliminary training, the men are transferred to landsmen training ships, where they remain for about nine months, acquiring the sea habit—that is learning how to live and care for themselves and their clothing on a cruising ship of war; the nature, relations and discipline of the navy; how to pull and handle boats; how to use great and small guns and small arms and numerous other duties which fit them for general service on regular men-of-war. The receiving ship is, therefore, the beginning of a man's acquaintance with the navy, and the impression then obtained has an important effect upon his career.

The receiving ships now in use are the Wabash, at Boston; Columbia, at New York; Minneapolis, at League island; Franklin and Richmond, at Norfolk; Independence, at Mare island, and Nipsic, at Puget sound. All of them, with the exception of the Columbia and Minneapolis, are old ships. The Wabash was built by the government at Philadelphia in 1854; the Franklin at Kittery, Me., in 1885; the Richmond at Norfolk, in 1858, the Independence at Boston in 1837, and the Nipsic at the Washington navy yard in 1873. The Minneapolis and Columbia are triple-screw cruisers. When the old Vermont was condemned as a receiving ship because of the appearance of contagious diseases among the men on board the navy department assigned the Columbia to succeed her. The need of supplying additional quarters for landsmen at the Norfolk yard induced the department to tow the Richmond from League island to that point and the Minneapolis was made the receiving ship at Philadelphia. But the number of men enlisted—congress has made large increases in the enlisted personnel, the force authorized now being 32,500—caused overcrowding on the ships with the result that illness developed and it was necessary to put the men ashore in tents.

Of all the great maritime powers, the United States is the only one that has adhered to the old custom of quartering its recruits and men not on commissioned ships on board naval hulks. The British admiralty, only a few years ago, decided to abandon entirely this system. Large and commodious barracks were constructed at the naval stations at Devonport and Sheerness, and at Portsmouth there has just been completed barracks which cost $3,251,440. The several barracks are so arranged as to form six separate buildings, each of which accommodates 500 and can accommodate 800 men. A large drill hall is provided, as well as a gymnasium, and drills and exercises are constantly going on. Contributing to the health and comfort of the men are mess halls and complete cooking arrangements, washrooms for scrubbing clothes, and hammocks and well-appointed bathrooms. A parade ground permits ample space for outdoor drills, and there are also grounds for cricket, football and other sports. In each building there are separate rooms for chief petty officers. The commanding officer has a handsome house. In addition, there is an administrative building with quarters, mess rooms and offices for the officers stationed at the barracks or seamen's quarters. Besides Great Britain, France, Germany, Italy, Austria, Russia and Japan have provided barracks for their enlisted men.

In the American navy as far as possible, the enlisted men have been placed on shore. The apprentices, for instance, have barracks at Newport, R. I., and Mare island, Cal. For convenience and comfort it was found necessary to supplement the quarters at the New York yard by buildings and sheds on what is known as Cob dock. Naval officers consider the buildings disgraceful and have been anxious that a structure more in keeping with the dignity of the government should be erected.

There is a large fresh-water basin at the League Island navy yard. When the ships now under construction are commissioned some of those in service will be repaired and placed in reserve; that is, ready for duty whenever called upon. To keep the ships in proper condition skeleton crews must go aboard them each day, turn the engines over, prevent rust, and familiarize themselves with every detail so that when the ship is commissioned they will form the nucleus of the crew and be able to handle the craft without difficulty. The successful execution of this plan will require the maintenance of a considerable force at League island, but there are no accommodations now at that point which can be utilized. To remedy this state of affairs it is considered desirable that barracks should be erected which will accommodate about 1,000 men. Similar quarters are also needed at Mare island. The Independence is a small ship and is frequently overcrowded. To supply the needs of the Asiatic station it is essential that a large force of men should be held at Mare island, but this is impossible under present conditions.

There will probably be some parsimonious members of congress who will place dollars above the health of the navy and will oppose authorization of barracks on account of the expense. The department is prepared to demonstrate that there will be an actual saving to the government by the erection of shore buildings. The annual cost of the Wabash, Franklin, Richmond and Independence is $237,500, this sum being the pay and maintenance of permanent crews. The barracks would accommodate a much larger number of men, and the size of the crews could be cut in half, so that the government would reduce the expense of the receiving service by about $120,000 annually. This sum is the interest, calculated at 3 per cent., on $4,000,000, almost double the appropriation the department desires for shore buildings.

Rear Admiral Henry C. Taylor, chief of the bureau of navigation, who has direct charge of all matters relating to personnel, is heartily in favor of barracks, and will devote considerable space in his forthcoming annual report to the necessity of their erection. When Secretary Moody returns to Washington the matter will be placed earnestly before him, and the officials are confident that he will look at it through the spectacles they now wear.

SEEN AND HEARD ON THE LOOKOUT.

Still carrying hemp shrouds, high-pooped and bluff-bowed, flying the German flag from the end of her gaff, a 500-ton brig that recently made New York terminated a long voyage for a vessel so small and antiquated. After loading with wine at Marseilles, France, and Malaga, Spain, this tiny vessel sailed round Cape Horn to Guayaguil, the seaport of the republic of Ecuador's capital, Quito. Having discharged her cargo, the brig next dropped anchor in a small inlet of the island of Tornaco, 200 miles west of the coast of Ecuador, where so-called ivory nuts were loaded. According to this skipper Tornaco is inhabited by one white man and about 200 human beings the hue of whose complexions varied from a pea soup color to dark navy blue. Asked about the ivory nuts that grow on the island he said that the larger ones would be made into billiard balls, and that the rest would be distributed all over the world where boiled shirts are *"de riqueur"* in the shape of collar buttons. When arriving here the crew of this vessel had been fourteen months on board, and the wonder is how such a voyage can possibly pay in these days of large and swift ships.

The master of an English bark, also returned from a voyage round Cape Horn, when becalmed off the group of islands known as the Galopagos, he went ashore on an exploring trip. Some birds and numerous pigs (several of the latter were shot on this occasion) were the only inhabitants noticed on the two islands visited. Returning to their vessel with a boat load of pigs the men saw numerous sleeping turtles floating near the bark, and after discharging the pigs very little difficulty was experienced in procuring a boat load of turtles. The captain is said to intend trying to interest some capitalists in his scheme of starting a turtle canning factory on one of those islands in the Pacific.

I said some time ago that the gasoline launches would be more popular than ever along the Atlantic coast this summer and they are already very numerous. Not only are they seen on almost all steam yachts, and a great many pleasure craft that are propelled by wind, but in several instances they have taken the place of former rowboat ferries. Those seen from yachts' davitts are about all alike as regards the position of the motor, which is well aft, while the gasoline tank is placed in the bow. It is now only in isolated cases that the owner of a yacht of any pretension to style is rowed to and fro. One boat, however, I noticed lately—she is soon to be launched—where the 14-H. P. motor is placed almost in the eyes in a little cuddy and only a foot abaft the gasoline tank, so that the engine has a cabin to itself while the passengers must be satisfied with the open cockpit. The wheel is a little to starboard of the cabin door with the drum and tiller ropes inside. The owner said he intended to handle her alone, and by pushing back a slide he could place his left hand on the reversing bar while steering with the right. This owner's contention that his cuddy offers better protection for the motor than the removable canvas cover usually found on small boats must be allowed, but it is certainly rather a disadvantage to have the weight of both motor and tank so far forward, as well as the necessity of having a greater number of bearings for a necessarily longer shaft. Having been kindly invited, however, to add my weight to the ballast on her trial trip I do perhaps best to refrain from saying more on this subject at present.

The mate of an English steamer showed me recently a simple mechanical contrivance by means of which anyone can test his knowledge of the rules of the road at sea. A ship has been drawn on a revolving disc, and ahead and on various bearings on each bow of the vessel holes have been made in the disc. On a card underneath are red and green marks which can be seen when the disc is turned. An arrow on the stationary outer rim shows the direction of the wind, and as the colored marks are

numbered it is quickly seen by consulting an accompanying reference card what a vessel is expected to do—keep clear or stand on—and why it has to do this. By moving the card fifty different situations are denoted, which cover practically every question that might arise regarding what a vessel should do under certain conditions.

It appears that there are different opinions regarding the advantages of having turbine engines installed in pleasure boats. Speaking with an engineer who modestly declared that he knew all about turbines, I learned that this type of engine uses comparatively little coal in her boilers when going at an extremely high rate of speed, but that when running under check the decrease in the amount of fuel used is hardly perceptible, and that the turbines would only prove of value on boats that are expected to run fast continuously. The owner of a pleasure craft only wishes to go very fast on a few exceptional occasions, and for yachts, my informant said, the reciprocating engine is yet without a dangerous rival. The turbine, however, is not without enthusiastic champions, confidently predicting a revolution in steamboat engine rooms, and who relate the wonderful showing made by the new cross-channel turbine boats, recently built on the Clyde. Whatever of truth there may be in the claim that, at very low speed, the turbine is a regular coal-waster, this engine, when perfected, will bid strongly for public favor.

It was in a place much frequented by steamboat officers that the captain of an ocean-going steamer gave it as his opinion that in crowded harbors small sailing craft should not have the right of way over large Atlantic liners. "Why," he continued excitedly, "when entering port with my 10,000-ton steamer the other day I had to have the engines reverse to allow a 100-lb. sailing dory to cross my bow, while the latter could so easily have gone under our stern." All the captains present considered it proper for sailing craft to have the right of way when outside, but that large steamers were often placed in awkward positions when entering port by members of the mosquito fleet sailing across the deep-water channel. F. H.

SPECIAL FAN FOR STEAMSHIP SERVICE

A special and interesting feature in fan building is just now receiving attention by the Buffalo Forge Co. of Buffalo, N. Y. We refer to a type of fan largely used on board ship for the double purpose of providing forced draft for the boilers and ventilation for the different parts of the vessel. The conditions of the installation, which are common for similar work, necessitate strong, substantial construction, and the best grade of engine for high speed under continuous use. Usually for serving these two purposes two distinct fans are necessary, one for furnishing draft for the boiler and the other for ventilation for the ship.

The combination fans, built for the United States government for service on revenue cutter No. 8, are a very good sample of the special type and have proven highly successful. They were two in number, approximately 70 in. high, having a wheel 50 in. in diameter and 22 in. wide at the center, the blades having an easy curve and made of heavy steel plate securely attached to "T" iron spiders, all accurately balanced in cast iron hubs to secure quiet and easy running without vibration. The side casings were made of heavy steel plate, the ends being constructed of heavy wire screen instead of the usual steel casing. The fans were equipped with Buffalo Forge ring oil bearings with extended shaft for direct connection to a Buffalo 5x5 double-vertical double-acting engine, with cylinder above shaft. The engine was of first-class construction and workmanship, being especially specified by Capt. Collins, engineer in chief of the revenue cutter service.

After the construction of the fan and engine the system is very simple. The fan was supplied with a side connection, to which galvanized iron ducts to different parts of the vessel were attached. Through these ducts the air from the ventilated portions was drawn and blown out through the screen ends, supplying the draft to the boilers.

In this method the double service is accomplished with the single cost of fans, care, power and space.

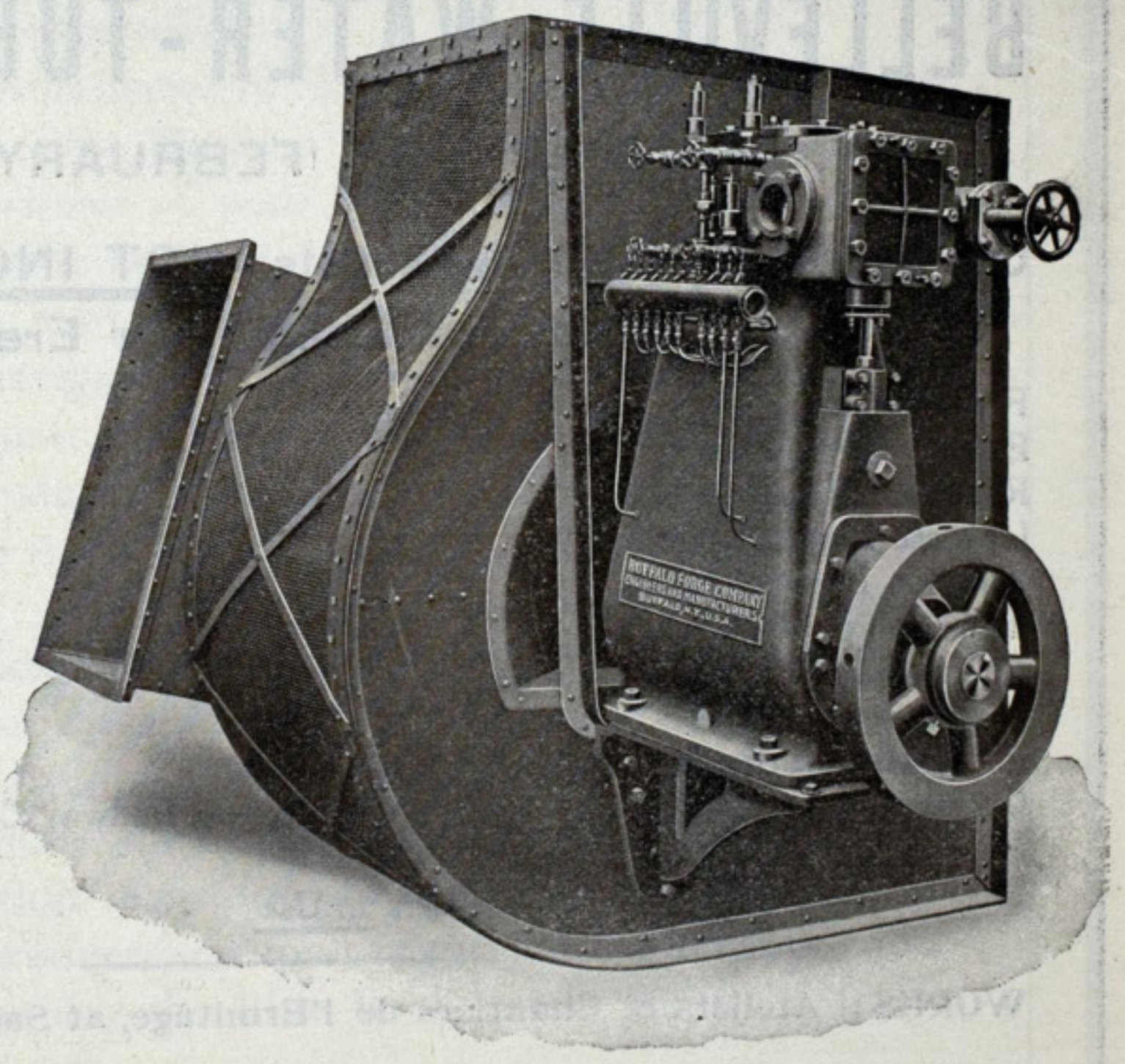
The system of superposed turrets on warships has been condemned by the French naval commission which has been experimenting with the battleship Henry IV. The final trials were to test the possibility of men occupying the lower turret while firing was going on from the upper turret. Four sheep were tied in the lower turret to represent gunners. After ten shots had been fired three of the sheep were found to be dead. The fourth had broken away and had sought refuge in the captain's cabin.

SUCCESSFUL TRIAL OF A FINE CARGO STEAMER.

Baltimore, Md., June 10.—At the Sparrow's Point ship yard of the Maryland Steel Co., this week, the principal topic has been the trial of the fine live-stock and cargo steamer Maine. Everybody is highly pleased with the outcome. The Maine is one of four new steamers of something more than 8,000 tons and about 5,500 H. P. that are to engage in the service of the Atlantic Transport Line, one of the constituent companies of the International Mercantile Marine Co., between Baltimore and London. Two of the vessels, the Mississippi and Massachusetts, are already in service. The fourth is the Missouri, the completion of which at the Sparrow's Point works was delayed by fire some months ago. She will be launched later in the summer. These vessels have all been described in the Review. They are among the finest freight steamers afloat.

Leaving the ship yard, the Maine steamed directly down the bay as far as Barren island, where she was sent several times over the measured-mile course to put her engines in good working trim and to provide data for the engineers in charge of the tests of her operating machinery. After spending a night at Norfolk she proceeded to sea. The course selected for the test under seagoing conditions was the one lying between the Cape Charles lightship and the Winter Quarter lightship, which is almost exactly 60 miles. The circumstances were favorable to a very fair test of the ship's capabilities, the sea, wind and weather being just about what an Atlantic liner may expect to meet three-fourths of her time at sea. There was a fair but not a heavy sea running and a fresh breeze off the starboard quarter going up the course which was the direction selected for the trial. The ship passed the Cape Charles lightship at 10:23 in the morning and left the Winter Quarter lightship astern 3 hours and 54 minutes later, having made 15.4 knots over the course. This more than met the contract requirement of 15 knots, and indicates that the Maine will have plenty of spare engine power to carry out the schedule of 12 knots which she is expected to make on her regular trips, and to exceed this if necessary. Not an incident or mishap of any kind occurred during the trip, and not a bearing was heated at its conclusion. In all respects the trial was pronounced by the officials who participated in it one of the most successful they had ever witnessed.

Several well-known officials of the steamship company, of the Pennsylvania Steel Co., and of the Pennsylvania and B. & O. railway companies were aboard during the trial and were fittingly entertained by the builders of the vessel. The officials who conducted the trial were Mr. A. G. Wilson, general manager of the marine department of the Maryland Steel Co.; Capt. Allen Luckhurst of the Atlantic Transport Line, who has had charge of the construction of the vessel; Mr. Barton P. Fielden, who has similarly had charge of the construction and fitting of her engines, with his assistant, Mr. P. Kirkaldy; Mr. H. A. Mogoun, engineer of the Maryland Steel Co.; Mr. Thomas Cornbrooks, naval architect and chief draughtsman; Mr. Geo. Shepard, chief engine draughtsman, and Mr. R. Wilson and Dr. W. J. Trainor, all of the Maryland Steel Co.; Capt. James Creighton, who is to be the commanding officer of the Maine, and Mr. H. Muirhead and Mr. G. W. Perkins, who are to be her chief officer and chief engineer, respectively.



SPECIAL MEETING OF STEAMBOAT INSPECTORS.

Washington, D. C., June 10.—The special meeting of the Board of Supervising Inspectors of Steam Vessels, now in session in the Lenman building in this city, which was called by the secretary of the treasury to amend the rules and regulations applying to steam navigation and to recommend changes in existing laws, is destined to be by far the most important meeting in the board's history. Notwithstanding the unpropitiousness of the weather, the board is working 10 hours a day. Even at this rate it will be several weeks before its labors are completed. Present are George Uhler, supervising inspector-general of steamboats, president; R. S. Bodie of the New York district; J. W. Oast, Norfolk district; R. J. Whitledge, St. Louis district; J. D. Sloane, Dubuque district; E. L. Dorsey, Louisville district, secretary; S. R. Crumbaugh, Cincinnati district; C. H. Westcott, Detroit district; James Stone, Cleveland district; J. A. Cotter, New Orleans district. The only absentee is Mr. John Bermingham of the San Francisco district.

Mr Uhler and his associates in the board are determined that the various steamboat and allied interests of the country shall be given the fullest opportunity to make known their ideas, needs and desires in the premises before any decisions are made. Several hundred communications from important individuals and concerns have been received already, and to these the board is now giving consideration. What lake interests demand is sometimes diametrically opposed to the desires of New York and New Orleans, and vice versa. Therefore, to give ear to all these various arguments and yet arrive at the best and most satisfactory conclusion is the difficult job cut out for the board at the present meeting. The general conclusion already arrived at, however, and which has all along been the expressed opinion of the Marine Review, is that the present laws governing steam navigation in the United States are entirely inadequate and out-of-date, and that the next session of congress must mark the passage of those which will be more serviceable and satisfactory to the larger interests of the country.

"Our recommendations to the secretary of the treasury in regard to the passage of new laws and changes in old laws will be most complete," said Mr. Uhler today. "That they will be transmitted to and considered by the next congress is a certainty. Our work is hard, but it is demanded by the necessities of modern methods, rules, regulations and laws governing steamboat navigation. Our merchant marine strength is growing at a wonderful rate."

The board went into special session on the 3d inst. and since that time a number of men representing the great shipping and allied interests have appeared before it. Among them are John Fehrenbach, representing the western steamboat men; E. D. Miers of the Heine Safety Boiler Co. of New York; Lieutenant-Commander Edwards; W. K. Kavanagh of the Wiggins Ferry Co.; Capt. Luther B. Dow of the American Association of Masters & Pilots of Steam Vessels; Mr. Reilly of the National Tube Co.; W. Wallace of John Brown & Co., furnace manufacturers, and F. G. Osborn, representing the National Board of Steam Navigation.

Assistant Secretary of the Treasury Robert Armstrong appeared before the board at the beginning of the session and explained the necessity for revision of laws, rules and regulations. Judge Reeves, legal officer of the treasury department, also was present and gave his ideas as to what recommendations should be made.

Mr. Kavanagh of the Wiggins Ferry Co., St. Louis, somewhat surprised the board by saying that the laws, rules and regulations now in force were all right and that no changes were needed. The boiler people thought that a special commission to look into their needs in the matter of legislation should be appointed.

The members of the board were the guests of General Uhler at luncheon today, and it is probable that they will soon be asked to meet Mr. Cortelyou, the new secretary of the department of commerce and labor, of which the steamboat bureau will become a part July 1.

Tri-weekly tourist car service by way of the Nickel Plate road. Every comfort of modern train service is provided at very small cost. Berth rates less than half the price of regular Pullman service. Get particulars from nearest agent, or from E. A. Akers, C. P. & T. A., Cleveland, O. 66 June 12

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NOW IN USE (FEBRUARY, 1903)

On Board Sea-going Vessels, NOT INCLUDING New Installations Building or Erecting.

French Navy	276,460 H. P.
English Royal Navy	849,300 "
Russian Imperial Navy	193,900 "
Japanese Imperial Navy	122,700 "
Austrian Imperial Navy	32,900 "
Italian Royal Navy	13,500 "
Chilian Navy	26,500 "
Argentine Navy	13,000 "
The "Messageries Maritimes" Company	87,600 "
Chemins de fer de l'Ouest: (The French Western Railway Co.) Steamships plying between Dieppe and Newhaven	18,500 "
Total Horse Power of Boilers in Use	1,634,360

WORKS: Ateliers et Chantiers de l'Ermitage, at Saint-Denis (Seine), France.

TELEGRAPHIC ADDRESS: Belleville, Saint-Denis-Sur-Seine.

United Marine Mfg. & Supply Co.,

MANUFACTURERS OF AND DEALERS IN

ELECTRICAL MATERIAL

FOR SHIPS AND FORTIFICATIONS.

ALBERT C. JAHL, General Manager,
100 William St., New York, U. S. A.

STAGES OF WATER ON THE LAKES.

The gage records of the United States lake survey show the following mean stages of water above mean sea level, for May, 1903:

	Stages during May.	Higher than during same month last year.	Higher than during May, 1895
	Feet.	Feet.	Feet.
Lake Superior	602.01	0.23	0.19
Lake Michigan	579.99	0.12	0.25
Lake Huron	579.90	0.24	0.22
*Lake Erie	573.18	1.23	1.61

The present fall, Lake Huron to Lake Erie, is 0.99 ft. less than a year ago.

*Reported by Cleveland Office.

Further examination of the chart of Buffalo harbor, published by Mr. Henry P. Jones, shows its great value. There are no harbor charts like it. It is unfortunate that similar charts cannot be had of all the lake harbors. It is compiled from the latest government, state and city surveys. The scale is 400 feet to the inch. The territory covered is from the Lackawanna steel plant and city line on the south to O'Neil street and city line on the north and from a quarter of a mile to a mile inland. Depth of water in Lake Erie, Niagara river, Black Rock harbor, Erie Basin, Buffalo harbor, Buffalo river and the city ship canal are all shown, as are also name, location and capacity of all grain elevators, principal manufactories, railroad connections, property owners. harbor lines, the proposed ship-canal through Black Rock harbor, fluctuation in level of Lake Erie during past five years, etc. It is on cloth and sells at $7. It may be had from the Marine Review.

Plans are under consideration by the Pacific Coast Steamship Co., San Francisco, Cal., for the construction of two passenger steamers. These two vessels are in addition to the two schooners to be built by the same company for the Seattle-San Francisco run. Details have not as yet been announced.

For the purpose of obtaining new ships and new terminals the Merchants & Miners' Transportation Co., Baltimore, Md., is considering the advisability of increasing its capital stock by $400,000. The company's lines take in Boston, Providence, Philadelphia, Baltimore, Norfolk and Savannah.

Colonists and homeseekers' excursion rates to west, northwest and southwest by way of the Nickel Plate road. Call on nearest agent, or E. A. Akers, C. P. & T. A., Cleveland, O.
69 June 12

reaching the marine trade

is best accomplished through the Blue Book of American Shipping.

An advertisement in the Blue Book is a passport into every ship yard and steamship office.

If you are a manufacturer of anything used in a ship yard or aboard ship, the Blue Book is a constant letter of introduction to the consumer of your products.

It is a fixture on the desks of ship builders, engine and boiler builders, steamship managers, wrecking companies and in all pursuits allied to navigation. It is consulted daily.

Your advertisement can no more escape observation than virtue can its ultimate reward.

The Blue Book is the only marine directory published in the United States. The 1903 edition is now in course of preparation. Its field is so well defined, and it stands so close to its trade that an advertisement in it cannot fail to bring results. It does not appeal to an indiscriminate and general public but to the man who wants the goods you make.

Fullest information regarding the scope of the Blue Book will be given to any advertiser upon request. But promptitude is a necessity. The day the Blue Book comes from the press is only a few weeks off.

ADVERTISING RATES ARE:

Full page - -	$75.00
Half page - - -	40.00
Quarter page - -	25.00

MARINE REVIEW PUBLISHING CO.,
39-41 Wade Building,
Cleveland, Ohio.

VENTILATING EQUIPMENT FOR TURKISH CRUISER.

All reports from the works of the Cramps, Philadelphia, regarding the cruiser Medjidia which they are building for the Ottoman empire are to the effect that no pains are being spared to embody in this vessel the latest improvements in naval construction and that she will be an effective fighting machine in every way. One feature which has been looked after with particular care is the ventilation. which is of very great importance in a vessel serving in tropical or sub-tropical waters. Nine electrically-driven centrifugal fans are provided to ventilate the hull of the Medjidia. Fan No. 1 is a 40-in. steel-plate "exhauster," which will supply air above the protected deck, forward, while No. 2 of the same size will supply air below the protected deck forward. Fan No. 3 is an exact duplicate of Fan No. 1 and will supply air between frames 65 and 66 aft. No. 4, of the same size, will furnish air aft of frame 66. No. 5, which is a 50-in. steel-plate "exhauster," will supply air to the dynamo and evaporating rooms. No. 6, a "Monogram exhauster" having a cast-iron housing, will supply air to the crew's quarters between frames 10 and 24. This fan is bolted to the ceiling and is driven by an electric motor supported on the side of the fan. Fan No. 7, which furnishes air to the crew's quarters between frames 24 and 34, is similar to Fan No. 2. Fan No. 8 for the crew's quarters between frames 34 and 35 is a duplicate of Fan No. 6, and Fan No. 9, of the same size and character, furnishes air to the officers' quarters between frames 55 and 83. The 40-in. fans are capable of supplying 4,260 cu. ft. of air at 1 ounce pressure when running at 822 revolutions per minute and 1½ ounces when running at 1,010 revolutions. The 50-in. fan will supply 3,690 cu. ft. at 1 ounce pressure at 660 revolutions, and 1½ ounces at 808 revolutions. The four "Monogram" fans can supply 2,110 cu. ft of air at 1 ounce pressure running at 822 revolutions or at 1½ ounces when running at 1,030 revolutions. The entire ventilating equipment was furnished by the B. F. Sturtevant Co. of Boston.

COAST SHIP YARD NOTES.

A new oil-burner steamer for the coast trade, to be named Shasta, is under construction at Hoquaim, Wash., for the E. K. Woods Lumber Co. She will be 220 ft. long, 36 ft. beam and 14 ft. deep.

Crawford & Reid, Tacoma, Wash., launched last week the tug Katahoon for the International Fisheries Co. The tug is 65 ft. long, 12 ft. beam and 6 ft. depth of hold. Her engines will be installed by the Puget Sound Iron & Steel Works of Tacoma.

Cobb, Butler & Co., Rockland, Me. launched last Saturday afternoon the steamer Monhegan for the Portland & Rockland Steamboat Co. She is of the following dimensions: Length over all, 143½ ft.; beam, 26 ft. 7 in.; depth of hold, 11 ft. The frame is of oak, the ceiling of hard pine and the planking of hard pine and native oak. The vessel was designed by John J. Wardwell.

TRADE NOTES.

The Sherwin-Williams Co. of Cleveland has purchased a tract of land adjoining its factory and intends to erect a building to provide better shipping quarters and to care for its growing printing plant.

The De Laval Steam Turbine Co., 74 Cortlandt street, New York, has issued in bulletin form a translation from the report of High Privy Councillor Wichert of the Prussian national railways at the German engineers' convention on the subject of train lighting with De Laval steam turbines. The report is a very interesting one and is well illustrated. It will be sent to anyone upon request.

The Scully Steel & Iron Co. of Chicago has just issued its stock list for May and June. It is very complete and very carefully indexed. The book also contains useful information to engineers, such as finding the circumference of a circle, the solidity of a sphere, the surface of a ball, capacity of tanks, heating surface in tubular boilers and other matters of interest to mechanics. The company has also issued a little booklet devoted to its wrought steel floor plates. These plates are very popular among architects, engineers, ship builders, contractors, master mechanics and others upon whom rests the responsibility of designing steel structures in which strength and lightness must be combined.

The British Westinghouse Electric & Manufacturing Co., Ltd., outbids German and Austrian manufacturers and wins another large municipal contract in England, the competition among manufacturers having been unusually keen and speculation rife as to the successful tenders. The London county council, however, at a recent meeting, closed a contract with the British Westinghouse company, amounting to about $590,000 and calling for 200 tram cars which are to be used on its lines south of the Thames. This is the largest order ever given for electric cars in England. One half of the cars are to be of the single-truck type, thirty-two tenders having been received for these. The remaining 100, for which twenty-six tenders were received, will be double-deck, bogie-truck tram cars, which are to be delivered in twenty-eight weeks.

The proposal to establish a harbor commission at St. John, N. B., is not receiving general support in that city, the harbor improvements committee of the city council having passed a resolution favoring a trust to control the wharves at Land point and the other facilities for the west side. The position taken is that a general harbor commission would develop the ocean-going wharves at the expense of the coastwise trade, for which the city has provided wharves on an extensive scale. A committee was appointed to draw up a plan for a limited commission.

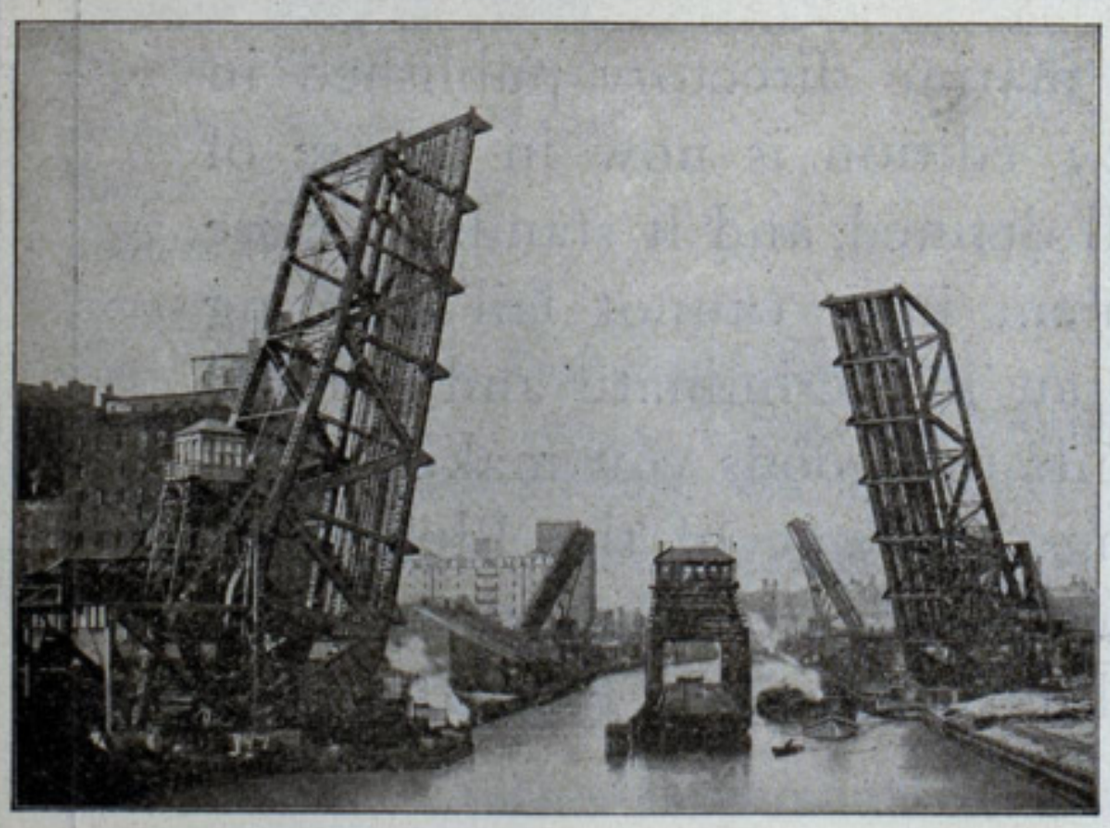
"Seaboard Steel Castings"

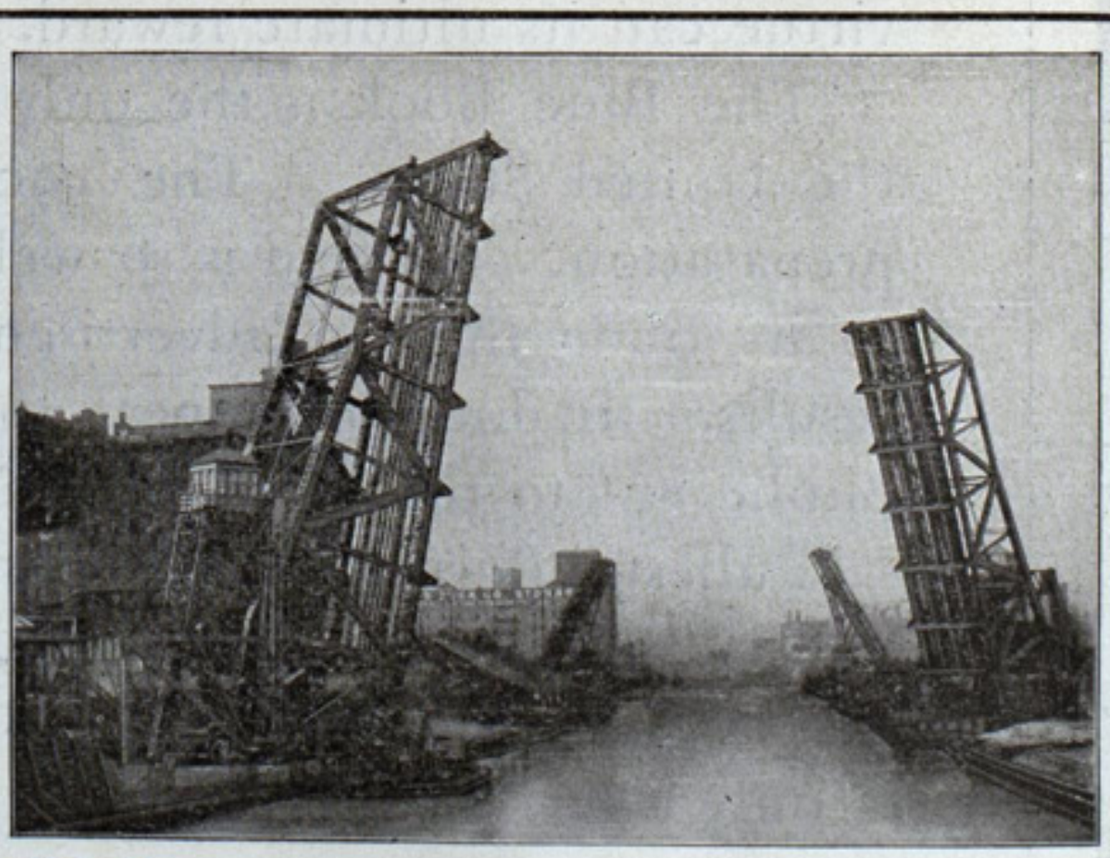
A Guarantee of Quality.

Open Hearth Steel Castings of the Highest Grade for Locomotive, General Machinery and Shipbuilding Work.

Subject to U. S. Government, Lloyds, Railroad and Other Highest Requirements.

Seaboard Steel Casting Co.,
Chester, Pa.





TWO VIEWS OF
THE SCHERZER ROLLING LIFT BRIDGE

across the Chicago River at entrance to the Grand Central Station, Chicago, before and after the removal of the old center pier swing bridge, showing the obstruction to navigation caused by the center pier and protection pier of the old swing bridge, and the wide and unobstructed channel given by the new Scherzer Rolling Lift Bridge.

Preliminary Sketches and estimates of cost furnished without charge to responsible parties in any part of the world, upon request accompanied by the necessary data.

THE SCHERZER ROLLING LIFT BRIDGE CO., Main Offices: 1616 Monadnock Block, CHICAGO, U.S.A.